MEGA SIZE, MINI PRICE! Schumacher Nitro Big 6

RADIO CONTROL car action

THE WORLD'S BEST-SELLING RC MAGAZINE

47380

RECORD-BREAKING RUN 111 MPH

INSIDE INSANE RC pg 116

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contents

Volume 16 ■ Number 5 ■ MAY 2001

features

DEPARTMENTS

COLUMNS

ON THE COVER (from top): Schumacher Nitro Big 6 on the pipe; Team Losi's Dirt Spec Triple-XT touches down; the Mugen MBX-4 XR Works drifts past the camera. (Walter Sidas and Nikon F5 in action.)

track tests

Show 'em what you got!

The RC business is booming. The cars are the best they've ever been, and in many cases, they actually cost less than the top hardware of yesteryear. There are more categories of vehicles—and more brands in those categories—than we've seen in years.

High-quality, high-performance, ready-to-run kits have made RC accessible to countless would-be hobbyists and have converted them from "would-be" to "are-now." Trucks, touring cars, on-road, off-road, nitro, electric; no matter what you're into, it's a great time to be an RC'er, and there are more of us than ever before. But I want to see even more people get involved in RC; as far as I'm concerned, there can't be too many of us! But how do we let the rest of the world know how much fun we're having?

Some believe racing events are the key, while others feel we should look to television. Both can help, but I believe the best representative of RC is you, and the best way to spread the word about our hobby is for you to get your RC gear out in front of people. When you and your buddies run an impromptu Indy 500 out at the Mega-Mart parking lot, and you draw the inevitable crowd, be cool. Answer their questions because they're bound to have plenty. If you have a spare car that can take a curb hit, let some of the truly interested onlookers take it for a spin. Most important, direct them to the local hobby shop where they can get cars of their own (and pick up a copy of *Radio Control Car Action*, of course!).

Be an RC ambassador. If we can each bring just one person into the fold, our already strong hobby will become even stronger. There will be more shops, more tracks, more heats at your next race and more friends to bench-race with. Who doesn't want that?

IN THIS ISSUE

Team Associated's Cliff Lett did his own bit to get RC in the national spotlight by putting on a high-speed show for news cameras with his 111mph RC10L30 and 94mph TC3. Cliff was out for a world RC speed record, and we've got his high-tech machines for your inspection.

You might not get your car up to Cliff's speeds, but the most recent stock motors from Trinity and Reedy are some of the fastest yet. Steve Pond takes a look at the facts and features of Trinity's Green Machine 3 and Reedy's MVP and puts both on the dyno to see what kind of power they really make—and determine which is best for your car and track.

And if Old Man Winter is still lurking around your neck of the woods, you can bring the RC action indoors with any of the micro-size RC cars reviewed in Bob Hastings' "Micro RC Car Guide." If a tabletop Le Mans or basement Daytona is your idea of RC excitement, Bob has the cars for you.

One last thing: don't forget to vote in the 2001 Readers' Choice Awards! If you missed the ballot in the April issue, you can vote online at www.rccaraction.com. Don't miss out!

Peter Vieira
Executive Editor

RADIO CONTROL car action

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No Need to Wait!

I am 13 years old and I just got my first RC car—a Traxxas Rustler RTR. I've had lots of fun and no problems (so far). I wonder whether an ESC is worth getting? I'll probably get into racing when I have more experience. I use a 6-cell 1700 pack and a 20-turn Stinger motor.
LANCE HESS

Oh, yeah; definitely get an ESC. An electronic speed control is more efficient and reliable than a mechanical speed control, and it doesn't require any maintenance. I wouldn't worry too much about building up your experience before you race; as soon as you can drive well enough to keep the truck going in the direction you want it to go, feel free to enter a race. The best way to learn to race is to go out and race!
—Pete

T-Maxx Wins!

I just finished reading your comparison test of the T-Maxx and E-Maxx. Great story and great trucks! However, you neglected one very important part in your test—charging time. Charging two battery packs—especially the 3000mAh NiMH packs (not $25 as in your comparison sheet, but $70+ each, which adds $90 to the total of the E-Maxx) takes forever. I figure about an hour to fully charge with one charger (or two chargers that can handle the NiMH cells; that's another $100+). So, after spending more money, what do you get to do? Sit around while you watch me drive my T-Maxx the whole time!
Winner—T-Maxx.
JEFF MCPHERSON
Laguna Hills, CA

Good call; waiting for packs to charge can be a bummer. But we never claimed the prices quoted for setting up the E-Maxx in the E-Maxx versus T-Maxx sidebar reflected the batteries we tested the truck with. We figured most T-Maxx buyers would buy the cheapest of the cheap stick packs for the EZ-Start, and E-Maxx buyers would pony up for something a little better.
—Pete

Slow is Fast

I am writing in response to the "2WD Sport Truck Shootout." It was good, but a Stadium Thunder was faster than an RC10T3? I ask you: is a hopped-up RC10T3 comparable to the one you guys tested? My ancient Traxxas TRX-1 just slaughters it, as does my cousin's equally old Turbo Optima Mid SE. [email]
KEVIN

When it comes to electric-powered RC, there's really no such thing as a fast or slow car; it's the motors that are slow or fast. Put an 11-turn mod in the slowest car from the Shootout, and presto, it will be the fastest car. Put a silver-can 540 into the most exotic full-on race vehicle, and it will be as slow as just about any other similarly powered car.
—Pete

LRP Locks Out

We truly appreciate LRP's speed controls being included in your "2001 Reversing ESC Guide" (April 2001 issue), but because of an omission from LRP's manuals, there was an error in your "Manufacturer's Specifications" on pages 110 and 111. The chart indicates that LRP ESCs' reverse function cannot be turned off when, in reality, it can. To disable reverse, simply hold the setup button while you turn on the ESC. This feature is found on all LRP reversing ESCs with the exception of the Runner Plus, but it is not clearly stated in the manuals included with them. I have informed LRP Germany of the oversight, and we are confident that this omission will promptly be rectified. Thanks again for your inclusion of Associated/LRP in your reviews!
GARRY OWEN
Associated Electrics/Sales

Thanks, Gary! Your letter will spread the word until LRP has added the reverse-disable info to the manual. I'm glad you wrote.
—Pete

Even Super Roosters have limits

You might have already caught this error in your "Reversing ESC Guide" (April 2001), but I thought I should mention it because it is important. The Novak Super Rooster does have a motor limit in certain dual-motor applications. According to Novak's people, whom I have spoken to on the phone, using the Super Rooster with motors below 15 turns when wired in parallel is not recommended. When it's wired in series, the info in the "ESC Guide" is accurate; there isn't a motor limit. Wiring in series is good for run time, but since most people want speed and power, they will wire the Super Rooster in parallel, and they should stick with motors of 15 turns or more. [email]
DOUG GELOWITZ

Excellent info, Doug; I'm sure your fellow readers will appreciate you looking out for them. To quote the Super Rooster's manual: "Motors wired in series put the same load on the speed control as the total number of turns in both motors." For example, running two 10-turns in series is like running a single 20-turn motor. When wired in parallel, the opposite is true: "Motors in parallel double the load on the speed control." Running those same 10 turns in parallel would be like running one 5-turn motor! With this in mind, it's easy to see why Novak recommends that users stick with 15-turn motors in parallel, while any wind in series will be safe.
—Pete

YOU SAID IT "Who says RC isn't addictive?"

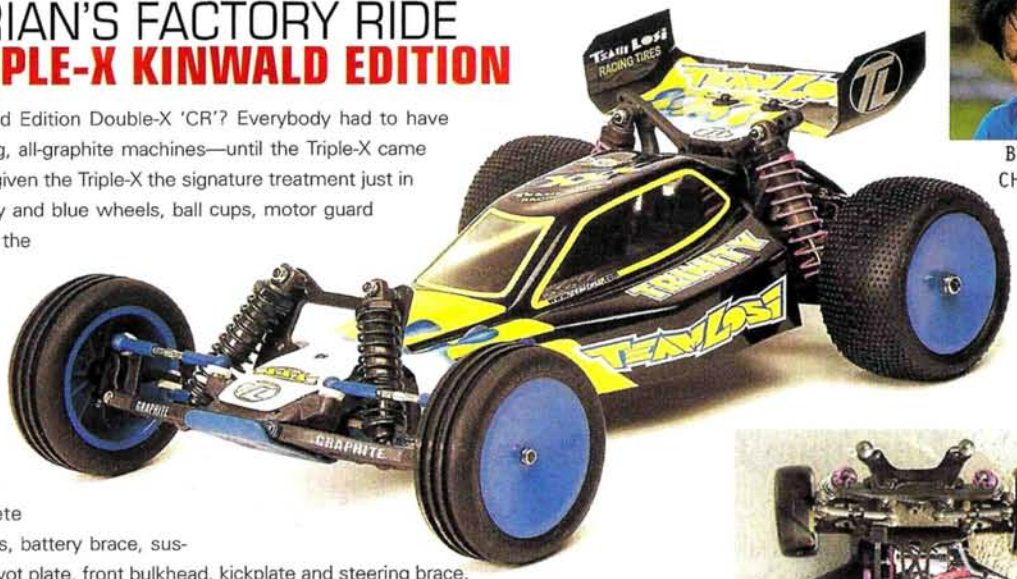
I have been building and racing RC cars for several years. About a year ago, I bought a Stampede just to toy around with. I took it to work to play with at lunch. Needless to say, it drew a crowd. A couple of weeks later a buddy of mine came in with a Stampede. You know how it went from there: the challenge was issued. Now we race just about every day through lunch (we have been known to get back from lunch a little late). I am in the process of getting my butt whooped by a rookie, but I am having a ball. Who says RC isn't addictive? RC rules. You guys rock; keep it up.
DOUG LITTLE
BLOOMSDALE, MO

No, Doug; you rock! Thanks for bringing a new guy into the hobby. I'm sending out a couple of modified motors to you so you and your racing nemesis can up the ante!
—Pete

CONTACT US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one. EMAIL ■ Derek Buono: derekb@airage.com ■ Chris Chianelli: chrisc@airage.com ■ Bob Hastings: bobh@airage.com ■ Kevin Hetmanski: kevinh@airage.com ■ Steve Pond: stevep@airage.com ■ Peter Vieira: peterv@airage.com ■ Greg Vogel: gregv@airage.com

BY CHRIS CHIANELLI

FOR SALE: BRIAN'S FACTORY RIDE
TEAM LOSI TRIPLE-X KINWALD EDITION



Remember the Kinwald Edition Double-X 'CR'? Everybody had to have one of the blue-spring, all-graphite machines—until the Triple-X came along. Now Losi has given the Triple-X the signature treatment just in time for summer. The Phobia body and blue wheels, ball cups, motor guard and bumper are easy to spot, but the best stuff requires a closer look. The latest Kinwald car includes ball-bearing steering, MIP CVD drive shafts, titanium turnbuckles, threaded and hard-coated shocks, titanium-nitride shock shafts and a hard-anodized aluminum top shaft and idler gear. There's also a complete graphite package, including chassis, battery brace, suspension arms, rear shock tower, pivot plate, front bulkhead, kickplate and steering brace.

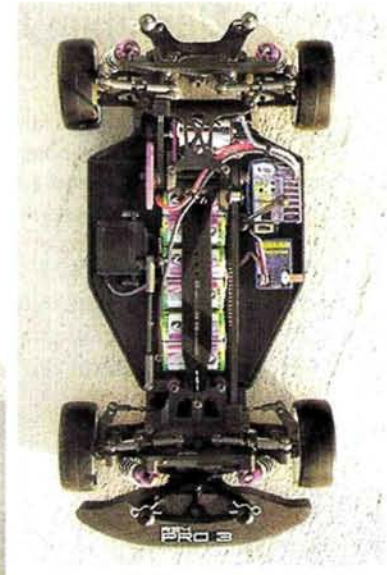
Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728; www.teamlosi.com.

PUNK POWER
TRINITY T-MAXX PUNK HEAD

Sure, Trinity says the Punk head will increase the cooling of your T-Maxx's TRX-15 engine, but what we really dig is the look; it's just one more way to make your T-Maxx a little different from the next guy's! The Punk head can even save you money; it uses a separate "button" to hold the glow plug, so you don't have to replace the entire head if you overcrank the glow plug and strip the threads. Available in blue only.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.

RS4 Pro 3



–the Next Generation

BY THE TIME YOU GET THIS ISSUE, the Pro 3 could be very close to its hobby-shop debut! The all-new RS4 is a dramatic departure from the original Pro and Pro 2, and it's the first RS4 touring car to use a molded chassis (the RS4 MT was HPI's first molded-chassis vehicle, but that was a truck). The Pro 3 is full of more features than we can list here, but here are the biggies:

- Molded-nylon composite chassis: like the current state-of-the-art off-road electric cars, the Pro 3's molded chassis has upswept sides for greater cornering clearance, and the pack is held along the chassis' centerline.
- Improved electronics access: no more snaking wires around the top deck; thanks to the down-the-middle pack placement and the wide "wings" on the sides of the chassis, the ESC, receiver and steering servo are all easy to access, and the ESC is held close to the motor to minimize the length of wire needed for hookup.
- Threaded-body shocks: according to HPI, when coupled with the included Teflon pistons, the Pro 3's molded-composite plastic shock bodies offer less internal friction than aluminum bodies, and a new Variable Volume System (VVS) eliminates bladders in favor of foam volume compensators.
- Easy battery access: a single body clip releases the battery pack, and stick, saddle, or side-by-side packs can be fitted.
- More: the Pro 3 also includes new, stronger HPI ball cups; precut foam bumper; captured stainless-steel hinge pins; improved diff access; front bumper brace with transponder mount; new 2.25:1 drive ratio; horizontal motor mount; MIP CVD drive axles; and more!

HPI Racing, 15321 Barranca Pky., Irvine, CA 92618; (949) 753-1099; fax (949) 753-1098; www.hpiracing.com.

Dynamite that Maxx!

Dynamite Aluminum Chassis Parts for Traxxas Maxx

We haven't done an official count, but the Traxxas Maxx series has to be the most hop-uppable truck out there. Dynamite is the latest to offer a line of parts for the big trucks—all anodized in "Dynamite Red." Dynamite's lower skidplate and chassis braces are shown; gearboxes, bulkheads, steering blocks, bellcranks, bumpers and more will be available soon. All the parts include mounting hardware.

Dynamite; distributed by Horizon Hobby Inc., 4105 Fieldstone Rd., Champaign, IL 61822; (217) 355-9511; www.horizonhobby.com.

ULTIMA RB GETS GASSED

Kyosho Ultima RB Sports

From the looks of this photo, Kyosho will offer a nitro-powered version of its Ultima RB in a "ReadySet" package with Perfex transmitter and the trademark white electronics. Unsurprisingly, the drive train appears to have come directly from the Ultima ST nitro truck; the fuel tank, servos, and receiver box have been squeezed together to fit on the short-wheelbase buggy chassis, which uses a standard Ultima RB front suspension.

Great Planes Model Distributors, 2904 Research Rd., P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008; www.hobbico.com.

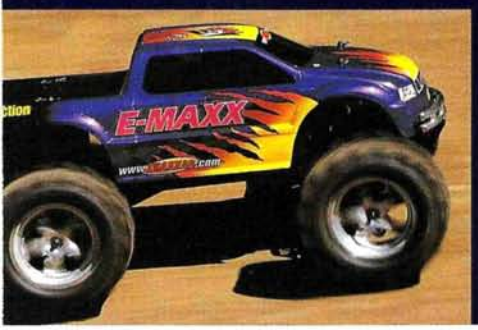
Explosive C4 Debut

With the exception of black-anodized bulkheads instead of gold, the follow-up to the Andy Griffiths edition of the C4 doesn't look dramatically different from the previous model, but it's all about the details. The C4.1 does away with rear upper arms in favor of a camber link that permits the car's roll center to be changed. Multiple positions are available for the rear hinge-pin blocks so that anti-squat adjustments are possible; and the woven-graphite chassis extends the wheelbase to 265mm and is billed as being "tweak free." Returning C4 features include mono-crank steering, Serpent shocks with externally adjustable damping, molded battery cradles and absolutely flawless construction.

Corally; distributed by Specialized RC Intl., 1480 S.R. 436, Casselberry, FL 32707; (407) 681-5906.

ROOSTER SQUARED NOVAK ROOSTER COMBO KIT FOR E-MAXX

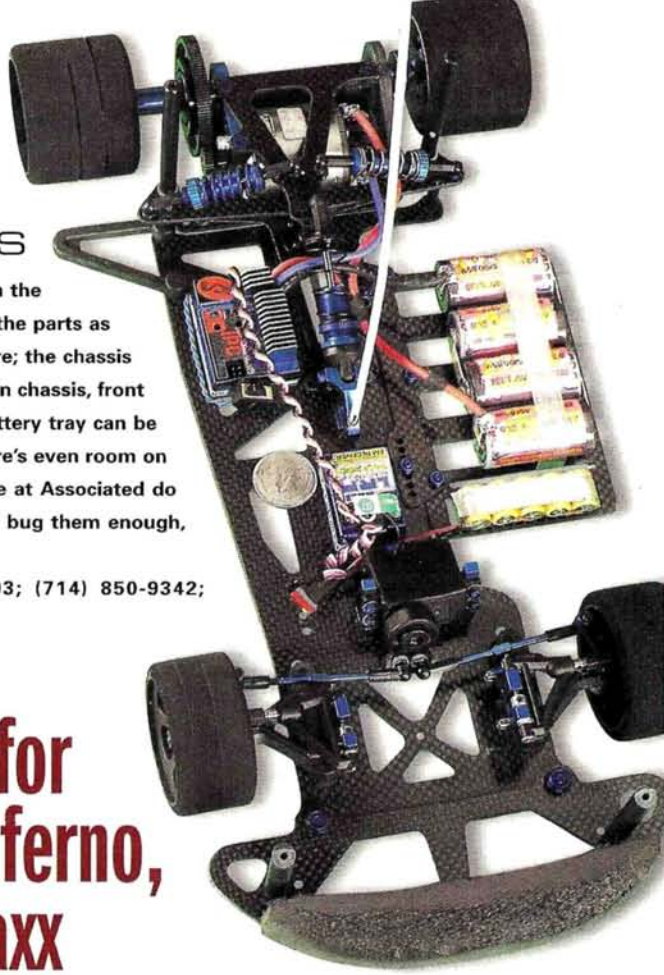
There are aluminum chassis and suspension widgets galore for the Traxxas E-Maxx, but Novak is the first to upgrade the dual-motor monster's electronics. The heart of Novak's Rooster Combo Kit is—you guessed it—the Rooster reversing ESC, which is one of Novak's burliest and most popular speed controls. The combo kit includes two Roosters and a Y-harness to control them from a single channel. This setup is gutsy enough to handle standard 05 motors as well as 075 motors down to 14 turns without altering the stock E-Maxx gearing. The combo's best feature is the Rooster's Smart Braking; any brake function is welcome on an E-Maxx, but Smart Braking actually senses when the motors have slowed to a safe speed before engaging reverse. This is an especially welcome feature on a heavy machine such as the E-Maxx. Novak Rooster E-Maxx Combo Kits will sell for about 8 percent less than the cost of two Roosters and a Y-harness bought separately; complete instructions for E-Maxx installation will be included.



Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92612; (949) 833-8873; fax (949) 833-1631; www.teamnovak.com.

SILVA SURFER

FACTORY TEAM RC10L30 CHASSIS



Daryl Silva ran a new optional chassis for the Associated RC10L30 to win the 4-cell Pro Mod class at the Snowbird Nats, and Associated now offers the parts as the Factory Team RC10L30 chassis kit. Daryl's winning car is shown here; the chassis kit will be offered in 4-cell and 6-cell versions, and it will include the main chassis, front bumper, chassis brace, battery tray, tray bracket and hardware. The battery tray can be adjusted fore and aft on the chassis within a 22.5mm range (3.5mm at a time). There's even room on the tray for a receiver pack, if you choose to run one. For now, the powers that be at Associated do not plan to offer a complete Factory Team L30 kit with the new chassis, but if you bug them enough, maybe they will.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626-1403; (714) 850-9342; fax (714) 850-1744; www.rc10.com; www.teamassociated.com.

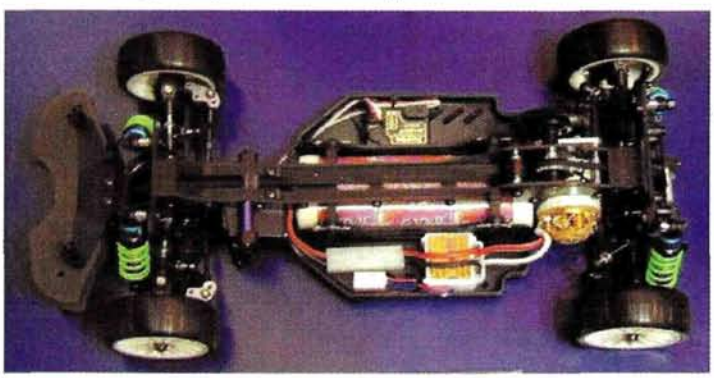
Fresh looks for Kyosho Inferno, Traxxas Maxx

Pro-Line offers two versions of its Humm-Vee shell; the Urban is the short-bed, street variation (shown in yellow), while the Militia sports a fully enclosed bed for Desert Storm-type action (in camo). Both bodies include window masks and a decal sheet and are custom-fit for the Traxxas Maxx. The Militia even includes Pro-Line's tall rear body mounts, which are also available separately.

Pro-Line, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968; www.pro-lineracing.com.

IS THIS THE KYOSHO TF-5?

Back in the March edition of "Inside Scoop," we showed you the prototype Kyosho KX-1 touring car. From the looks of this spy shot, the KX-1 may be closer to production than we thought, and it may debut as the fifth iteration of Kyosho's Touring Force series with a "TF-5" designation. That's how the car was labeled at the Nuremberg Hobby Show in Germany, where assistant editor Derek Buono snapped this photo, but the car may yet surface as the KX-1. Time will tell. With the exception of the molded "wings" that are home to the electronics, the car looks very similar to the previous KX-1 prototype. It features a narrow, carbon-fiber chassis in a ladder configuration, and it sports a single-belt drive system and aluminum shocks. The unusual aluminum extensions on the steering arms are an interesting touch. We'll provide more information as it becomes available.



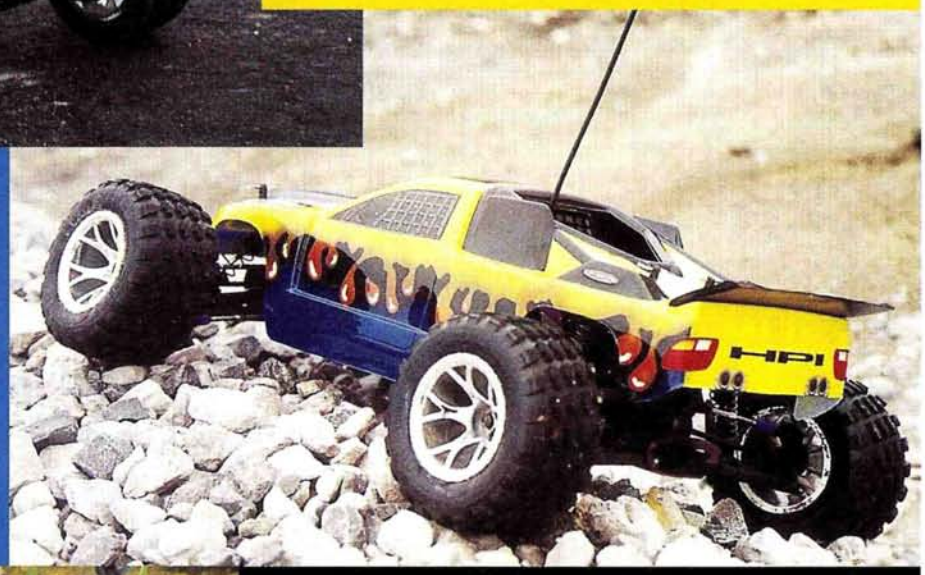
Kyosho; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; www.hobbico.com.

Readers' Rides

Win a one year subscription to *Radio Control Car Action* magazine! Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids), and a brief description, to Readers' Rides, *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subsciption to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Good luck!

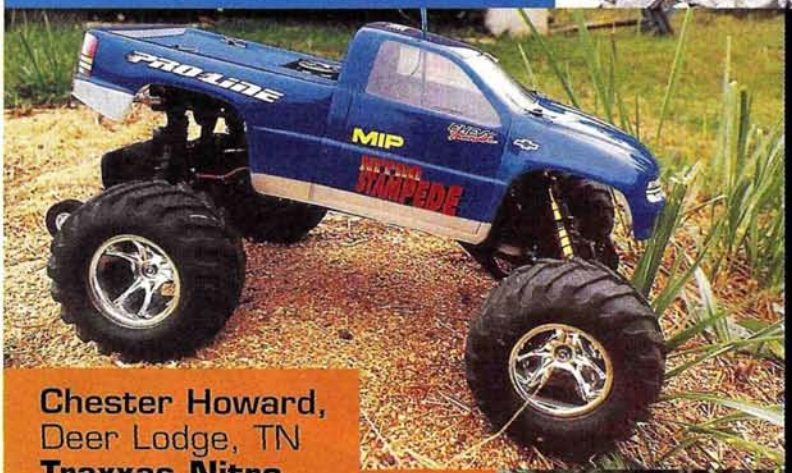
Chris Sagona, Marco Island, FL
Traxxas Stampede

We can usually tell at first glance which kind of vehicle a particular reader's ride happens to be; this one stumped us. Hidden beneath the classic lines of this Parma '57 Chevy body is a Stampede. The hot-rod is powered by a Trinity 10-turn motor controlled by a Novak Dually ESC, and those are RPM Clawz wheels.



Mariano Espinosa, Frisco, TX
HPI Nitro MT

Instead of waiting for the racer version of the Nitro MT to come out, Mariano decided to transform the one he had. His HPI truck is now equipped with a purple heat-sink head, a racing clutch, titanium turnbuckles and a stainless-steel hinge-pin set. The paintwork is Mariano's second paint job, and now he can't wait to airbrush HPI's Nitro MX-1 body.

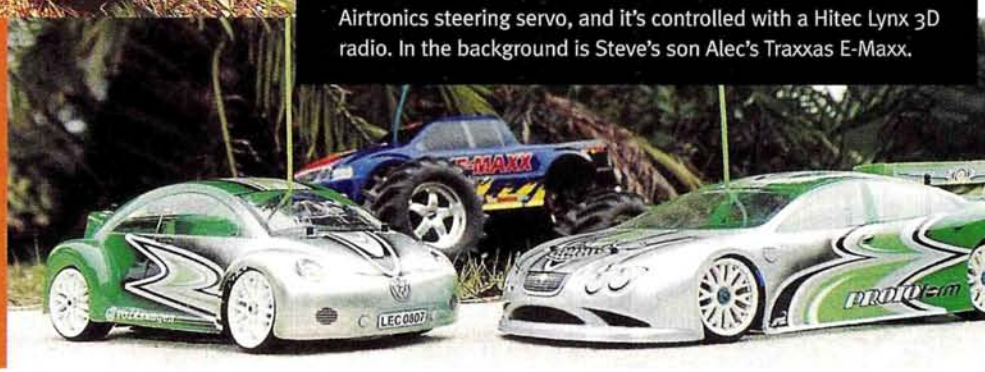


Chester Howard, Deer Lodge, TN
Traxxas Nitro Stampede

Chester describes his Stampede in one word: "bad!" What started as a stock Traxxas nitro monster truck has slowly evolved to what you see here. The truck has a Pro-Line Silverado body and Masher tires; RPM Clawz rims; MIP 360 pipe and CVDs; DuraTrax gold shocks; aluminum arms, bulkhead and axle stubs from GPM; and a set of Lunsford turnbuckles.

Steve and Nikki Norris, Cocoa, FL
HPI RS4 Mini Pro and Team Associated TC3 Team Edition

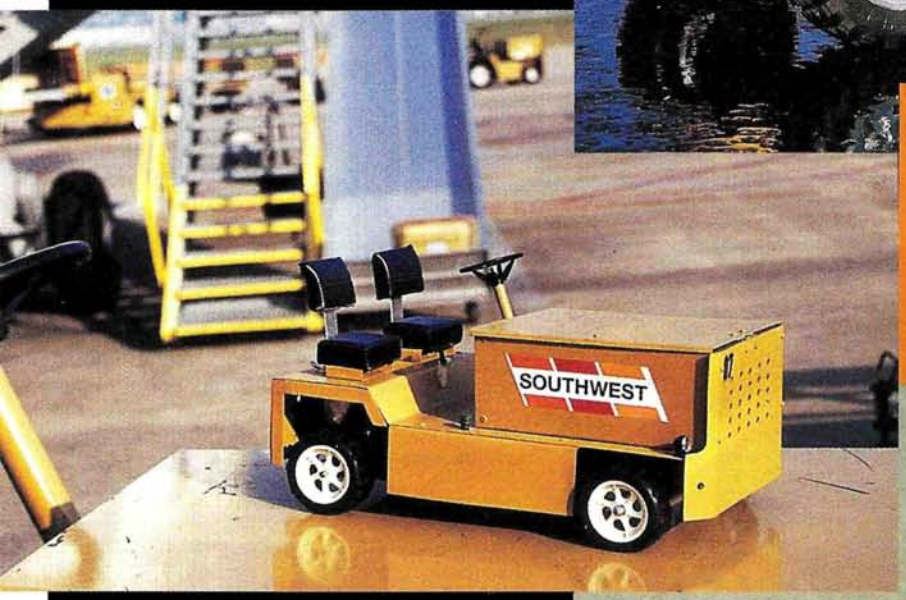
This is a father/daughter race team; on the left is daughter Nikki's HPI Mini Pro. The VW-body RS4 is equipped with MIP CVDs, carbon-fiber shock mounts, HPI motor heat sink and Robinson Racing diff pulleys and spur gear adapter. Nikki commands her car with a Hitec Lynx 3D radio, an Airtronics 94257 steering servo and a Novak Cyclone TC speed control. She painted the Bug herself and then added Team Orion body graphics. Dad's Team TC3 wears a Chrysler 300M Protoform body with Orion graphics, and the chassis is outfitted with IRS aluminum outdrives, LRP 7.1 speed control, Trinity P2k motor and an Airtronics steering servo, and it's controlled with a Hitec Lynx 3D radio. In the background is Steve's son Alec's Traxxas E-Maxx.



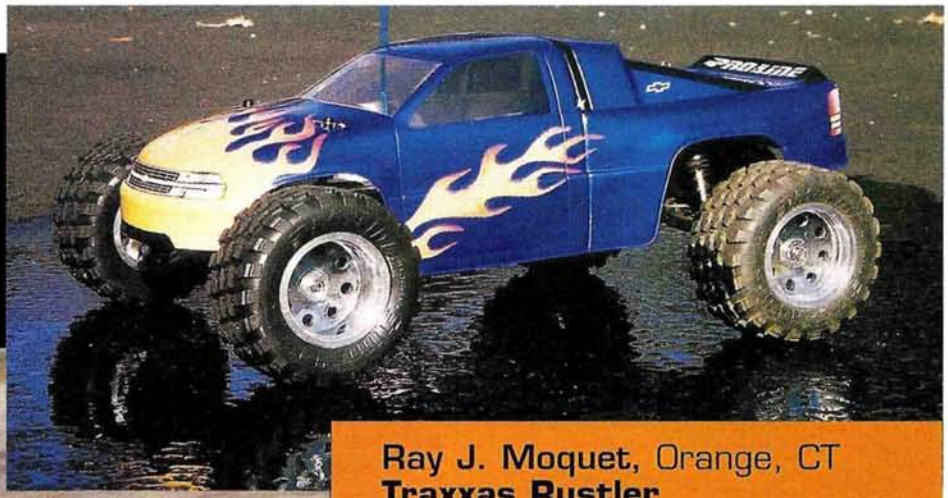
Readers' **Rides**

Perry Lea,
North Little Rock, AR
Home-Built Baggage Tug

This is the first RC airport baggage tug we've seen. Perry's creation is made of sheet aluminum and powered by a Trinity stock motor.

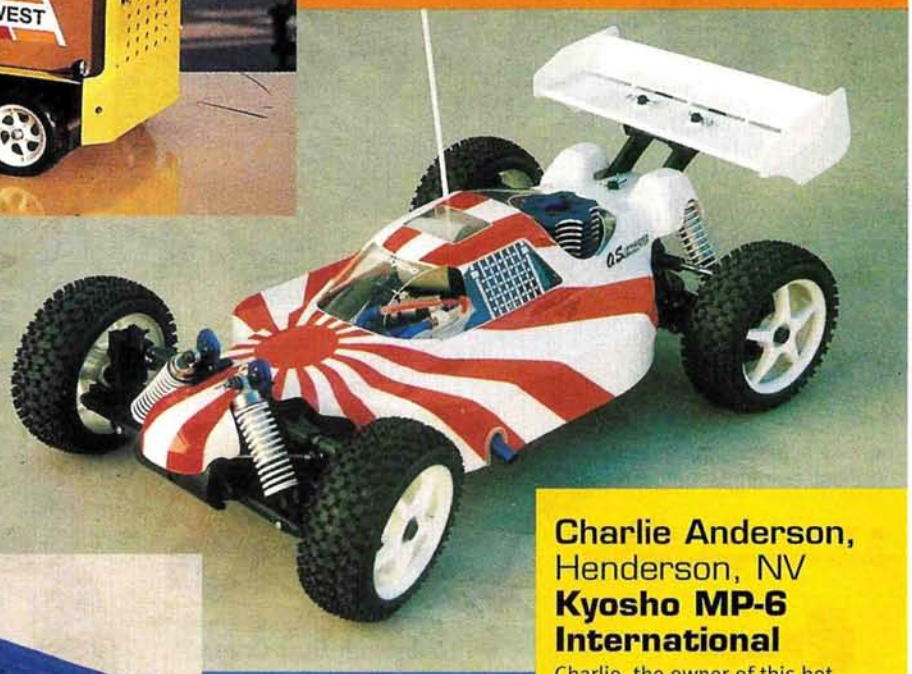


The tug features a Parma Hemi with authentic RAm engine sounds, Futaba radio gear, Tekin ESC and functional headlights and taillights. There's an extra servo on board, so the steering wheel moves in tandem with the front wheels. Perry says that if it wasn't for the model's 7-pound weight, the tug would probably be able to outrun the full-size version.



Ray J. Moquet, Orange, CT
Traxxas Rustler

It's a short trip to the off-road for this stadium truck; Ray built a track in his backyard. The RTR Rustler has been personalized with the addition of Traxxas chrome rims and an XL-1 ESC, plus a Pro-Line Silverado body and Dirt Hawg tires.



Charlie Anderson,
Henderson, NV
Kyosho MP-6 International

Charlie, the owner of this hot MP-6, did a great job of spraying the "rising sun" paint scheme. The 1/8-scale race buggy is equipped with an O.S. engine and pipe, Futaba 3PJS radio, 6V receiver pack and GS Racing silicone products.

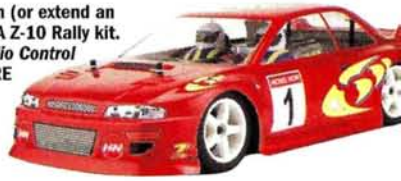
Chris Coffey,
Elk Grove, CA
Team Associated Factory Team TC3

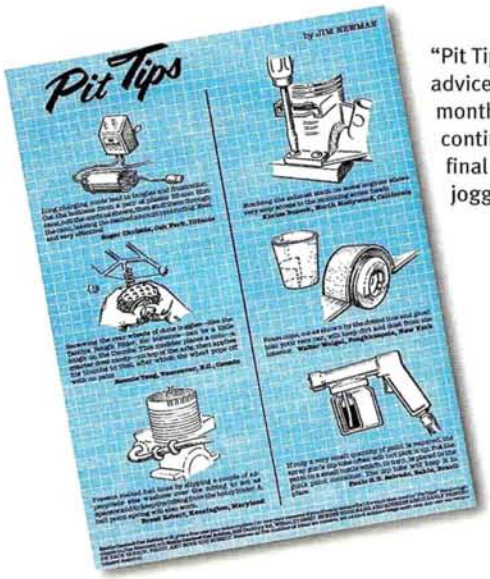
After driving his TC3, Chris says that he's in "touring car heaven." His TC3 is outfitted with a Reedy Rage motor, RC200 batteries, a Hitec 605MG steering servo, a Novak Cyclone ESC and a KO EX-1 radio. The racer is finished with a blue and white Andy's Stratus body and has a set of belted HPI slicks for grip.

Pit Tips

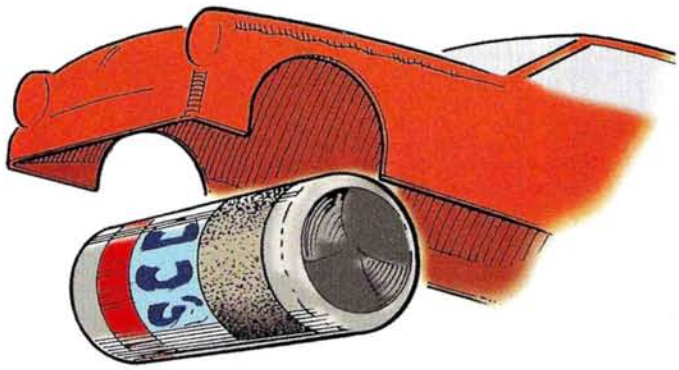
BY JIM NEWMAN

WIN AN OFNA Z-10 RALLY! ***Radio Control Car Action*** **will give a 6-month subscription (or extend an existing subscription) to the author of each idea used in "Pit Tips." "Top Tip" winners receive an OFNA Z-10 Rally kit. All published "Pit Tip" authors receive an OFNA yo-yo. Send a rough sketch to Bob Hastings, c/o *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one nor return unused material.**





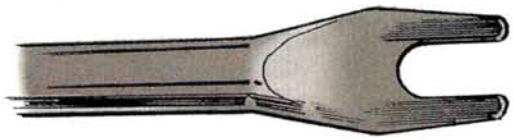
"Pit Tips" began in the summer of '86 as a forum for readers to help one another. Your practical advice, complemented by Jim Newman's technical artistry, remains one of our most popular monthly features. With this issue, Jim is retiring from *Radio Control Car Action*. "Pit Tips" will continue next month with illustrations by David Baker; in the meantime, we asked Jim for one final drawing and a few parting words. As we wish Jim good luck, let's look at some memory-jogging classics from the last 15 years and some tips that have stood out over time.



Wheel-Well Shaper—September 1990

To shape wheel wells, wrap sandpaper around a soda can; it's the right diameter, and it will give you a beautiful finish.

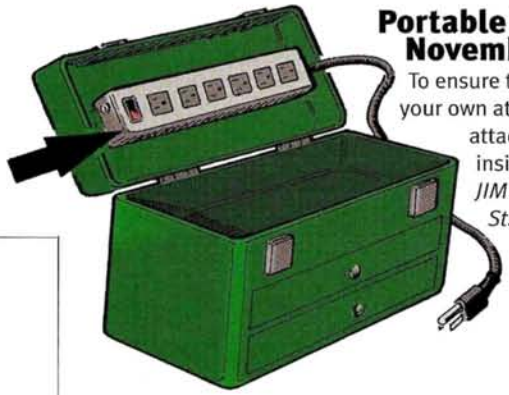
BRIAN HILL
Andover, MA



Ball-Link Remover—September 1990

Saw and file a slot of a suitable size in the blade of an old, large screwdriver, clean out the burrs, and you'll have an effective tool for popping off ball links without splitting the sockets (as usually happens when you try to twist them off).

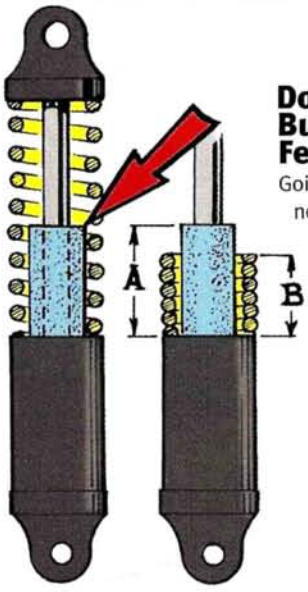
CHRIS SCRANTON
W. Salem, IL



Portable Outlet Strip—November 1992

To ensure that you'll have enough outlets of your own at the track, use double-sided tape to attach a six-socket outlet strip to the inside of your pit box.

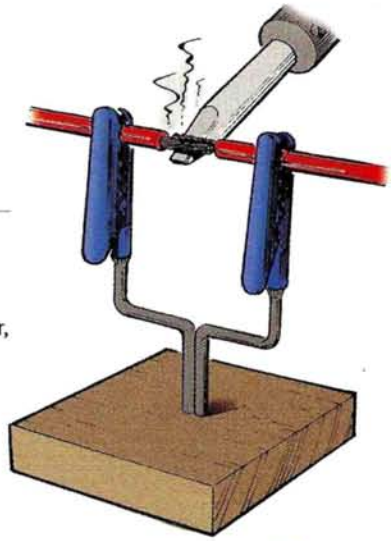
JIM ZEIHER
St. Clairsville, OH



Double-Dare Bump Stops—February 1990

Going over big jumps, Sean noticed that his shocks bottomed out with a crash. To soften the impact, he slipped a piece of surgical rubber tubing over each piston rod. Notice that the tubing (A) is longer than the fully compressed spring (B).

SEAN CANADY
Paris, Ontario, Canada



Soldering Jig—April 1991

When you're soldering two wires together, hold them with a simple device made of coat-hanger wire and alligator clips that have been soldered or epoxied together.

NEAL PANCHUK
Elora, Ontario, Canada

Pit Tips

Phillips Screwdriver Fitting—December 1992

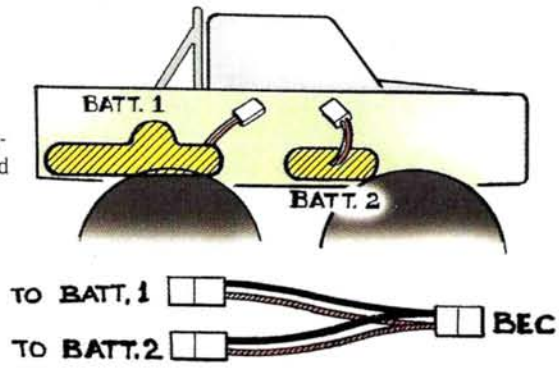
If your screwdriver won't enter a slot all the way, grind a little off one of the sides. This will allow the screwdriver to engage the slot more firmly.

FRED CHING
Monterey Park, CA

Long-Running Clod Buster—March 1990

Mike gets 20-minute runs out of his truck. He puts a flat pack in the usual position and a hump-back pack with similar voltage in the rear. The two are joined in parallel with the Y-shaped cable adapter shown. The voltage is still 7.2, but the battery capacity has doubled. Charge the packs separately.

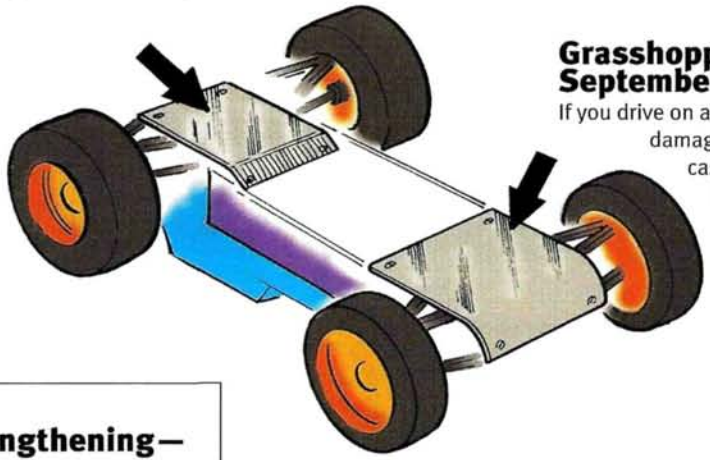
MIKE WILLIAMS
Salinas, CA



Grasshopper Skidplates—September 1990

If you drive on a rough track, you may have noticed severe damage to the bottoms of your A-frames and gearbox case. To protect these components, use 1/32-inch aluminum sheeting from the K&S rack of your hobby store. Cut and bend them to shape, then screw them to the underside of your car, as shown in this simplified sketch.

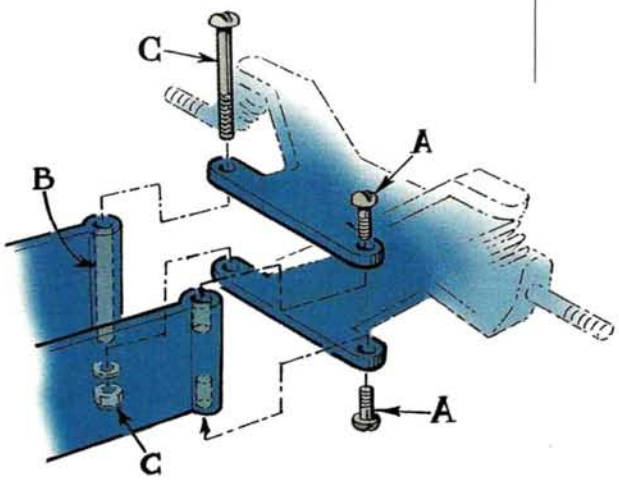
JASON PAPE
Lancaster, CA

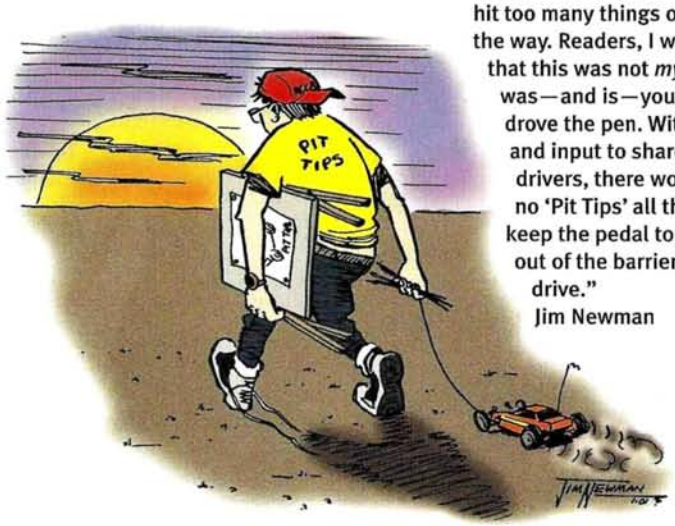


Falcon Chassis Strengthening—February 1990

Screws sometimes break out of the posts where the front suspension joins the chassis because the four screws (marked "A") concentrate stress at the top and bottom of the posts. This owner carefully drilled through the posts from top to bottom (B) then used 1½-inch hardware nuts, screws and washers (C) to eliminate this.

CHRIS RAHM
Lemington, Ontario, Canada





"It has been a great ride, and I didn't hit too many things or roll over on the way. Readers, I want you to know that this was not *my* column; it was—and is—yours. I merely drove the pen. Without your ideas and input to share among other drivers, there would have been no 'Pit Tips' all these years. So, keep the pedal to the metal, stay out of the barriers and enjoy the drive."

Jim Newman

Troubleshooting

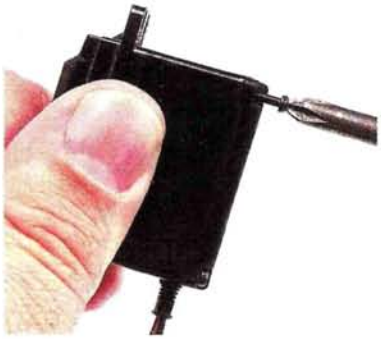
BY PETER VIEIRA

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at *Radio Control Car Action*, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

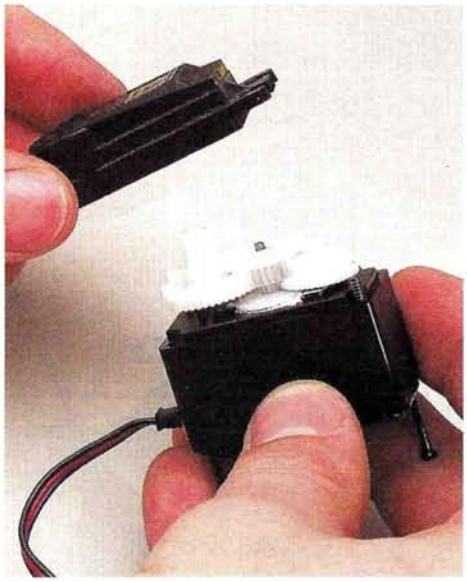
Broken Servo Case

I recently purchased a DuraTrax Maximum ST Pro and already hit a snag. I had just finished the engine break-in when I went over a low, flat rock, and the radio system shut down. I checked it out and noticed that the steering servo had snapped at its mounting tabs. I used superglue to fix it, and so far, it works. Will I need a new servo?

BILL WAGNER
GEORGETOWN, TX



First remove the four screws from the bottom of the servo case.



Now you can pull off the top of the case and replace it with a new one. While the servo is apart, inspect the gears for wear or damage.

Sounds as if you drove off a *big* rock. I suggest you replace the servo case instead of the entire servo; if your Hitec HS303 servo broke at the mounting tabs, you only need the top half of the case. You should be able to pick one up for less than $5 at your local dealer, or you can contact Hitec and order one directly. While the servo is taken apart, check to make sure you didn't damage the gears. It sounds as if you put the truck through some heavy use, so you may want to pick up spare gears even if your servo's originals are in good shape. If the glued-on servo tabs break again, remove the servo-mounting posts and remount the servo directly onto the chassis with servo tape from Bolink or Racers Edge. It will hold until you can buy a new servo case.

Temp-Gauge Calibration

A pan of water and a stove top (or hot plate) are all you need to check the accuracy of your temp gauge.

My Traxxas T-Maxx is all stock, and I run it on 20 percent nitro fuel. I cut out a circle in the windshield to aid in cooling, but my TRX Pro .15 still runs very hot, often over 320 degrees, according to my MIP onboard temp gauge. I set the needles back to the factory settings. This helped to bring the temperature down to 300 degrees or so, but that is still too hot—and it's winter! Plus, performance has suffered. I'm frustrated because I don't want to ruin my engine by overheating it, but it's pointless to run without any power. Help me, please!

JASON THOMAS
HAGERSTOWN, MD

Watch the reading as it climbs; if it's accurate, it will read 212 degrees when the water boils.

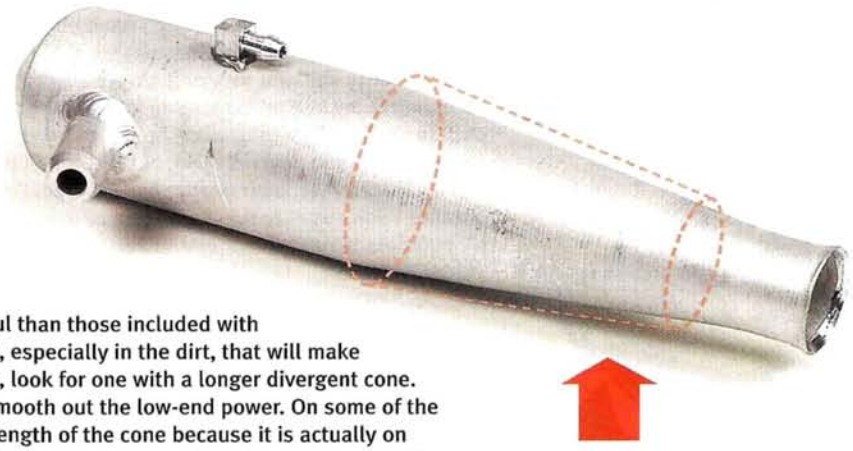
I checked with Traxxas; the recommended operating temperature for the TRX Pro .15 is between 260 and 310 degrees, so it seems you are in a safe zone. I do recommend that you calibrate your temp gauge to ensure it reads the right temperature. Take the gauge off the engine and head for the kitchen. Heat some water and submerge the temp gauge's sensor. As the water begins to boil, note the reading; water boils at 212 degrees Fahrenheit (100 degrees Celsius), and that's what your gauge should read. If it displays a higher temperature, subtract 212 from the reading to determine the correction factor. Let's say the gauge reads 250 degrees when the water boils: 250 minus 212 equals 38. When you check your engine's temperature, just subtract 38 from any reading to determine the actual engine temperature. Keep in mind that the gauge may not be off by the same number of degrees at all temperatures. But in the important 200- to 300-degree range, this simple correction method should be fine.

It's important to remember that there isn't one perfect temperature for all engines. Lots of tuners become slaves to temp gauges and wind up with badly tuned engines as they try to get a perfect 250 degrees on the temp gun. I suggest you tune your engine to perform reliably, then note the temperature reading; next time, you'll know which temperature range to shoot for.

Troubleshooting

Too Much Low-End Power

I currently race an Associated Factory Team GT with a Trinity/Picco .12 engine. I always seem to get too much low-end power, and I wonder whether I should switch pipes. I have also tried richening the bottom end, but that still didn't seem to work. What can I do?
ZACH VOLMERING [email]



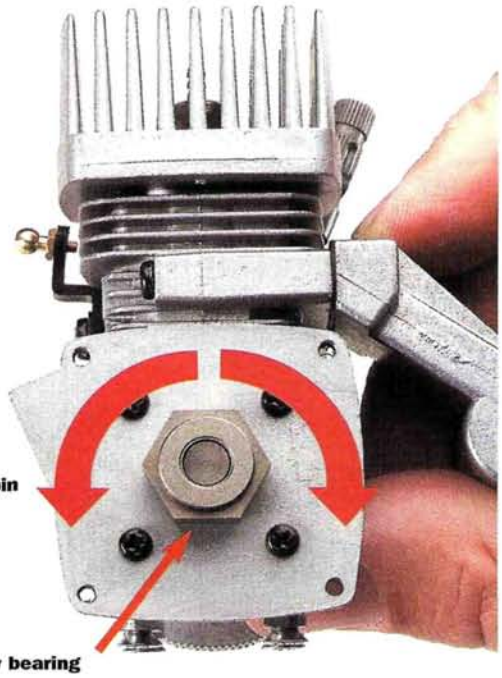
This pipe has a long divergent cone and should produce a broad powerband that will be easier to handle than the on-off feel a short-cone pipe may give.

Race engines such as your Trinity/Picco are more powerful than those included with most assembled kits, and if you are heavy on the throttle, especially in the dirt, that will make any vehicle hard to control. If you decide to change pipes, look for one with a longer divergent cone. Trinity and Picco offer pipes with longer cones that will smooth out the low-end power. On some of the newer dual-chamber pipes, it may be difficult to tell the length of the cone because it is actually on the inside of the pipe, but a call to the manufacturer will help. A pipe with a short divergent cone will increase low-end power and will make the problem worse. A carburetor restricter is a good idea for off-road racing. It limits how much air enters the engine and can make the low end more controllable. Dynamite and Associated make a set of fairly inexpensive restricters, and I think they will do a better job with your problem than a new pipe. Another solution is to go to a larger clutch bell. The taller gear ratio will take away some of the wheel-spinning; also, if your radio has exponential or adjustable travel volume, dialing that feature toward negative values will make the low end less sensitive by requiring more throttle input for servo throw.

Getting Strung Up

I took my pull-starter apart because it jammed, and now it doesn't work. I pull the string, and it comes out all the way but doesn't go back in. I took it apart again to rewind the string, and it just did the same thing. It's very frustrating, and I'm thinking about getting a starter box and removing the pull-starter. What should I do?
BILL ROBERTS
WATERTOWN, IL

I think you should read the "How to Rebuild a Pull-Starter" in this issue, and you should rebuild your starter one more time. But this time, make sure you install the one-way bearing in the right direction; it should turn freely counterclockwise and engage the drive shaft when rotated clockwise. I guarantee that you have it in backward right now. While it's disassembled, clean out the starter housing so it doesn't jam up again, and inspect the starter cord; if it is worn, replace it before you reassemble everything.

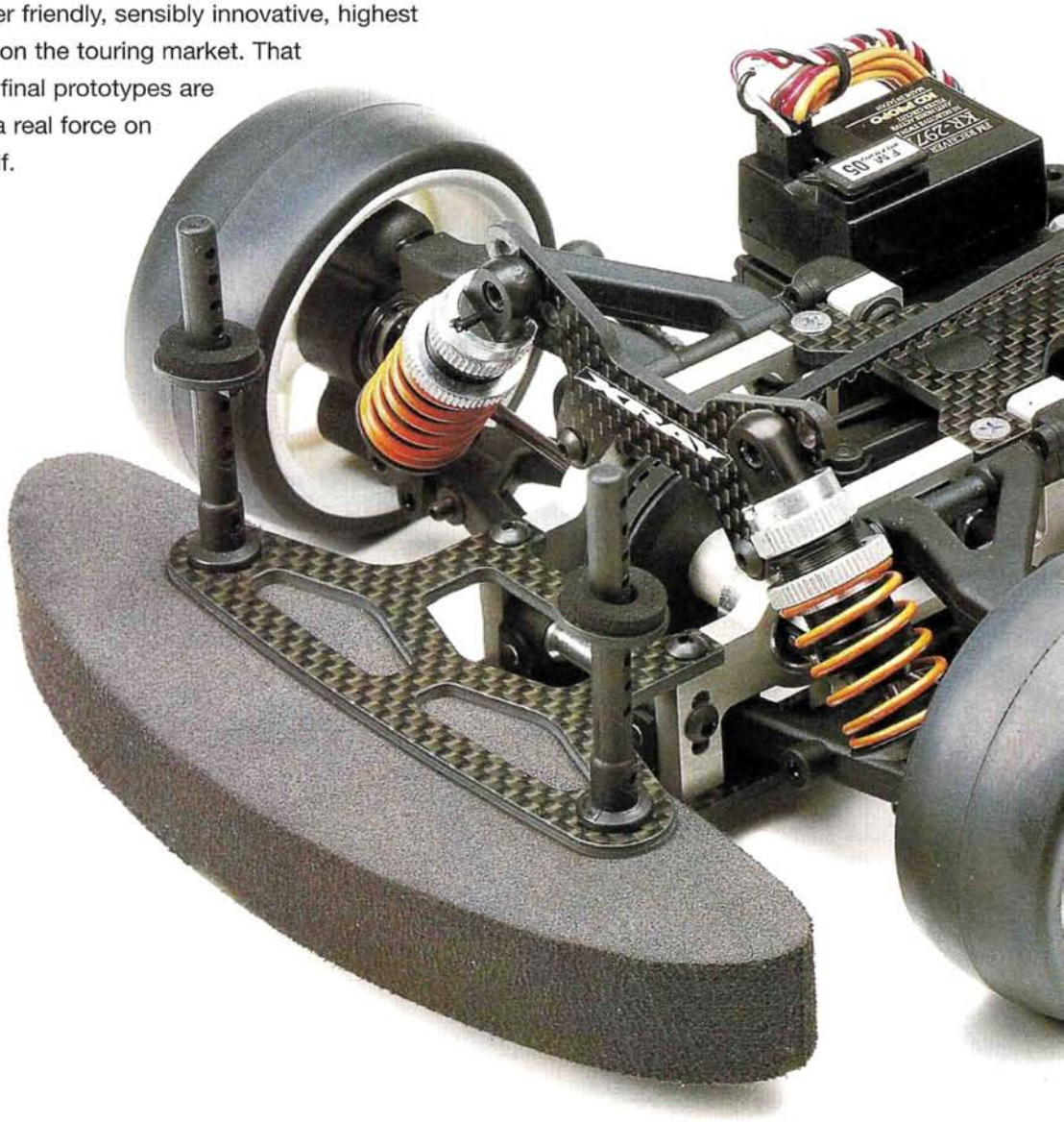


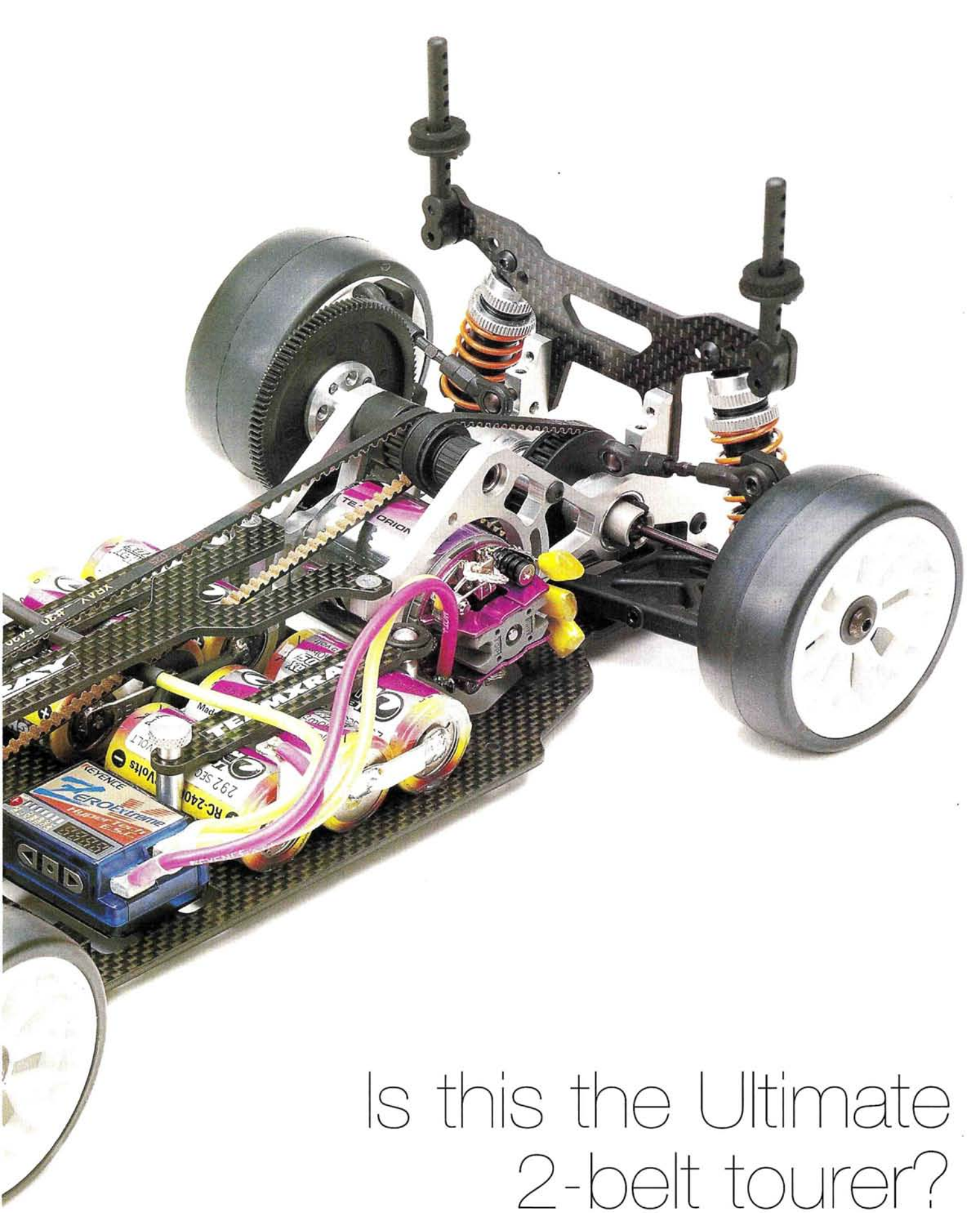
1st LOOK

by Peter Vieira

XRAY T1

There's no shortage of capable pro-level electric touring cars. From old standbys such as the HPI RS4 series to relative newcomers like the Associated TC3 and all the Schumachers, Yokomos, Kawadas and Corallys in between, the competition-oriented buyer has plenty of choices. A new brand trying to break into this crowded segment of the hobby is up against some of the fiercest competition in RC, and it had better have something unique to offer. Distributed by Serpent USA, XRAY is the latest to take on the challenge, and it has made its strategy clear with the T1: XRAY is out to build the most adjustable, user friendly, sensibly innovative, highest quality and best-performing car on the touring market. That isn't an easy task, but if XRAY's final prototypes are any indication, the T1 could be a real force on racetracks soon. See for yourself.





Is this the Ultimate 2-belt tourer?

TIME LINE TIME LINE TIME LINE TIME LINE TIME LINE

The Man With XRAY Eyes

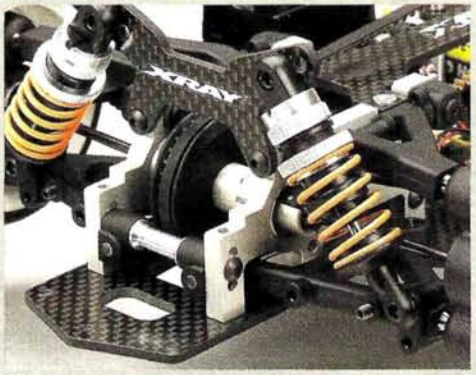
XRAY is a name that's new to RC, but Juraj Hudy, the man behind XRAY, has a long history of RC design.

Like many RC pioneers, Juraj began with slot cars. His designs dominated slots in Europe in the '70s, and Juraj himself won many national titles.

By the mid-'70s, Juraj's first hand-made cars began to appear. This 1978 nitro model relied on chassis flex for suspension.

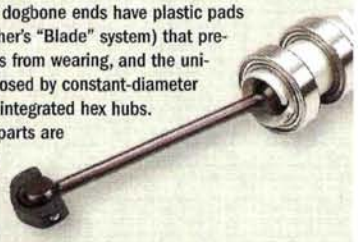
Juraj continued to refine his designs into the '80s, focusing on 1/8-scale on-road cars and working out of a tiny bedroom-size workshop.

In 1989, Juraj established "Special" as a brand, later renaming it "Hudy." With a larger shop and modern milling equipment, full production of Hudy products began. In the '90s, Hudy collaborated with Serpent to provide precision spring steel, Duraluminum and graphite parts for Serpent cars. In 2000, Juraj launched XRAY, a new company that is "focused on designing and manufacturing the most high-tech, high-quality RC racing cars."



Spring-steel inline universal axles

The Hudy Co. was contracted to produce the T1's spring-steel drive axles (and other parts). Spring steel is tough stuff that allows Hudy to make the axles very slender and light without compromising strength. And, since they're spring steel, the axles can spring back from any crash that's severe enough to make them flex. The axles' dogbone ends have plastic pads (much like Schumacher's "Blade" system) that prevent the diff outdrives from wearing, and the universal joints are enclosed by constant-diameter stub axles that have integrated hex hubs. These very compact parts are machined from solid duraluminum and then heat-treated and hard-coated.



Serpent shocks

XRAY specs Serpent shocks for the T1, and they're the same units as found on the Serpent Impulse nitro touring car. That means they have threaded plastic bodies, aluminum top caps and knurled preload adjusters, bottom-loaded seals and externally adjustable damping. Four hole patterns can be selected for each shock piston by completely extending the shock and rotating the mounting eyelet. There's a crisp detent for each setting, and the difference between the lightest and heaviest settings is dramatic.

Carbon-fiber chassis

When you crack open the XRAY box, you'll spot the assembled chassis, side plates and upper deck. It's an impressive sight, but you'll need to disassemble the parts to build the kit. The T1 uses carbon fiber for the primary chassis as well as the upper deck, shock towers and bumper stay. In addition to the usual battery and motor cutouts, the T1's chassis is relieved under the diffs so debris can escape, and holes are provided for optional bolt-on chassis weights (but if you really prefer to stick loose change on the chassis with servo tape, you still can).

Duraluminum side plates

The T1's beautifully machined side plates are made of heat-treated, hard-coated T6 Duraluminum and have been strategically relieved of extra material. At 5mm thick, the side plates should have no problem resisting any suspension forces, and they add considerable rigidity to the chassis.

Padded body posts

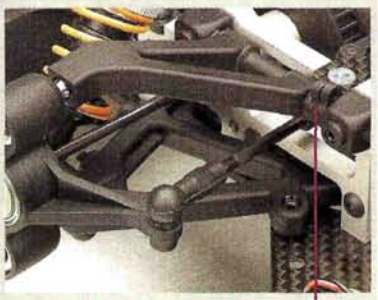
Even the body posts are trick! The padded body perches capture steel pins that are friction-fit into the posts.

Adjustable one-way pulley

The T1's layshaft-mounted one-way pulley is much appreciated on fast tracks, but one-way setups are often tough to handle on tight courses. Instead of swapping parts around to set the T1 up with full-time 4WD, you can simply lock out the one-way by cranking down a collar on the layshaft. You can even set the collar between extremes to control the amount of brake action you get—from zero (free-spinning one-way) all the way up to locked.

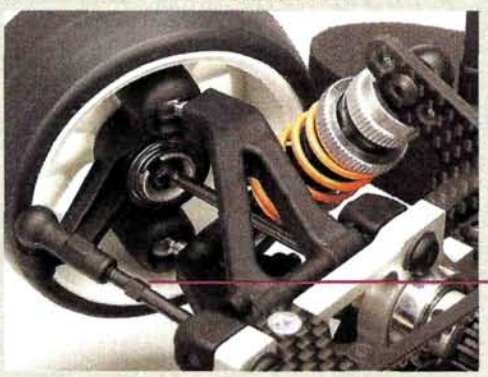
Pivot-ball hubs

Many pivot-ball cars have come before the T1, but the XRAY car has some of the cleanest and most precise parts we've seen. The 8.5mm spring-steel pivot balls are beautifully finished and operate with slop-free smoothness, and the compact hubs they fit into do not present any interference problems with popular sedan rims. The rear hubs use an upper camber link, but two lower pivot balls per hub make toe and track adjustments easy.



Adjustable caster

Like other pivot-ball cars, the T1's front caster is easily adjusted by relocating the clips that position the upper arm on its hinge pin. Caster can be adjusted from 1 degree to 11 degrees.

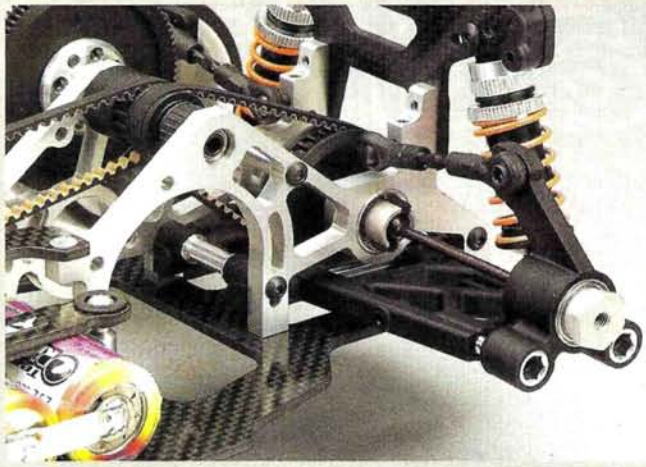


Spring-steel turnbuckles

What. No titanium? Although spring steel may not seem as sexy as ti, the resilience of the steel makes it a good material for the T1's linkages, and since the turnbuckles are very short, any weight disadvantage is insignificant.

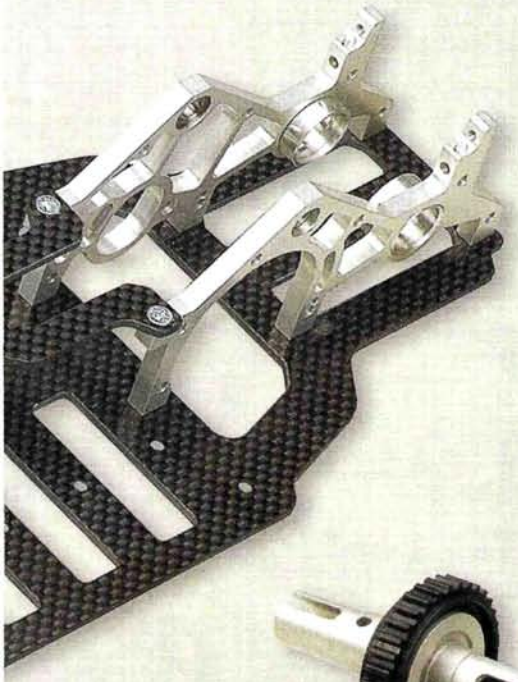
Hollow spring-steel layshaft

This is another Hudy-supplied part. The layshaft is 6mm in diameter, and it has a bonded, machined-aluminum spur-gear mount. If wobbly spur gears bug you, you'll love the T1's dead-on, no-runout spur-gear mount.



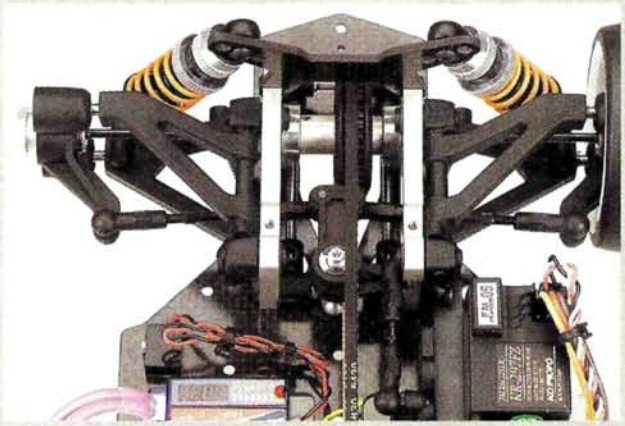
Adjustable rear anti-squat/anti-dive

The T1's side-plate construction makes it easy to incorporate adjustable arm mounts. Front arm kick-up ("anti-dive" in XRAY terminology) can be set at "zero" (hinge pins parallel with chassis), 1.5, or 3 degrees. In the rear, anti-squat may be set at zero or 3 degrees. All it takes to make either adjustment is the removal and replacement of two screws; if you have 30 seconds, you have time for kick-up and anti-squat adjustments.



Mono-crank steering

Single-bellcrank steering has been done before, but the T1's setup is among the cleanest we've seen. The bellcrank is thickly gusseted for rigidity and has an integrated, spring-loaded, cam-style servo-saver. An aluminum post supports the system and turns on ball bearings. Instead of simply pressing the bearings into holes in the chassis decks (which exposes them to carpet dust and road grit), the T1 uses plastic bearing holders to shield the bearings from such debris.



Externally adjustable ball differentials

This is one of the T1's simplest features; it's really little more than a hole in one of each diff's outdrives. The diff screw is held by an Allen key that goes through the hole, and you can tighten or loosen the diff by rotating the wheel opposite the outdrive. Simple.

A less visible feature of the differentials is the labyrinth seal system. The diff pulley flanges are a close fit on the machined, heat treated and hard-coated Duraluminum outdrives, and that helps minimize the amount of road grit and carpet dust that penetrates the flange. Any material that does get inside is trapped by concentric rings on the flange and outdrive. The tolerances are close, but there aren't any contact seals to increase friction.

Adjustable wheelbase

Much like the sliding upper arms that allow front caster to be adjusted, the XRAY T1's rear suspension arms can slide fore and aft on their hinge pins for wheelbase changes. Plastic clips hold the arms in the position you prefer, and a full 9mm of adjustment is available. Moving the lower arms affects the rear camber settings, but the XRAY designers had the foresight to build in telescoping pivot balls for the camber links. By loosening a setscrew, you can easily adjust the position of the camber link to match the position of the suspension arm.

THE VERDICT—SO FAR

The XRAY T1 is the most easily adjusted touring car we've seen. Caster, camber, front-arm kick-up, anti-squat, toe, ride height, diff tightness, wheelbase and track are all quickly set without swapping parts or disassembly, and the externally adjustable shocks really work. Even if you aren't the greatest chassis tuner, it's easy to try different setups with it (and, more important, to reset to previous setups), and anyone who's willing to pick up a wrench is bound to end the day with a car that runs better than it did for the first pack.

The T1's adjustability also makes it hard to sum up its track performance; since it's so quick and easy to dramatically change its handling characteristics, it really isn't fair to generalize and say the T1 hooks, or pushes, or doesn't do this but does that. How does the T1 handle? Well, how do you want it to handle? Look for a complete review of the production XRAY T1 soon. ■

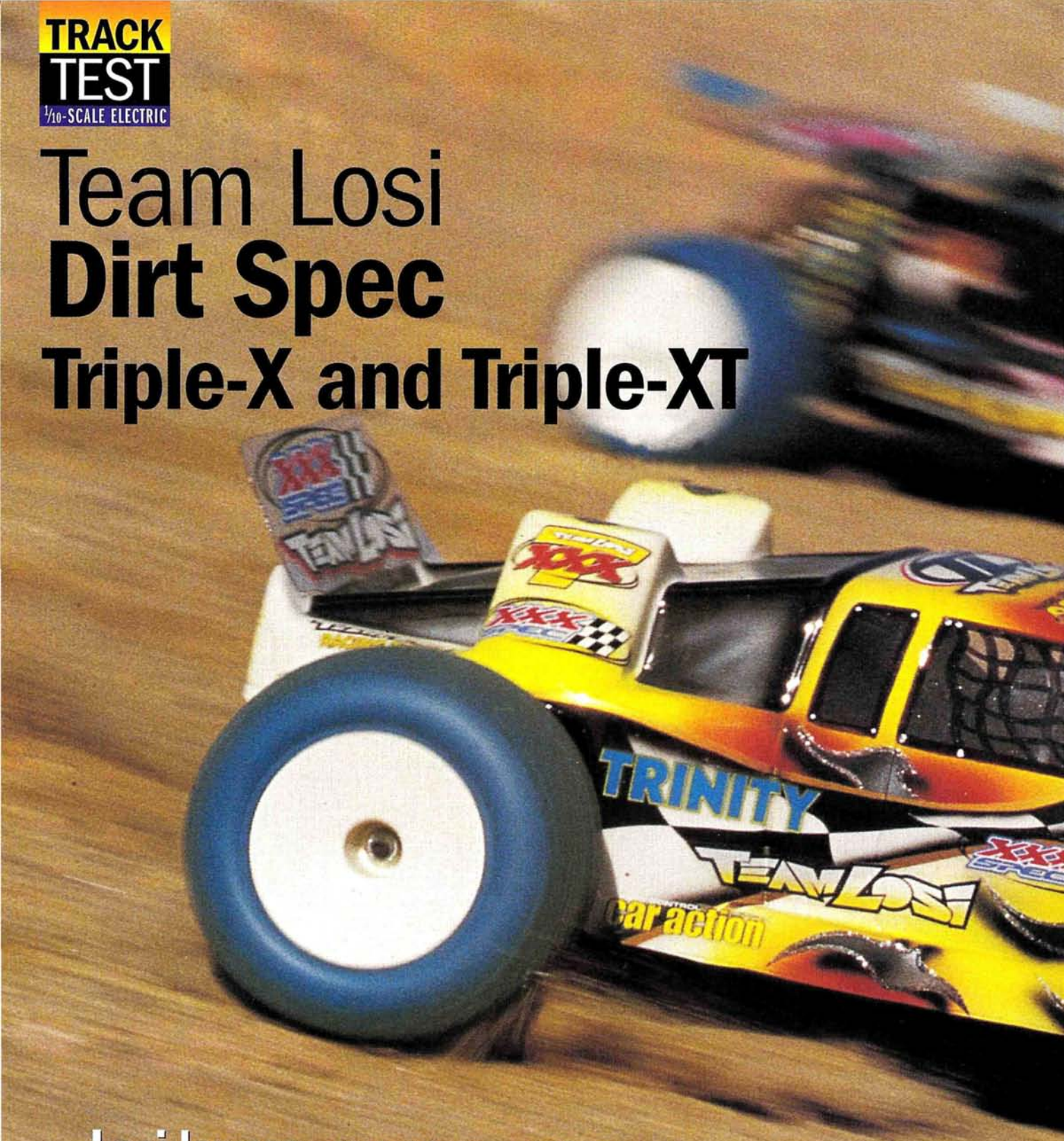
Integral battery hold-downs

Of all the T1's trick innovations, this one seems to get the most attention. The T1 holds its 6 cells firmly with graphite straps that are locked down with thumbscrews. Here's the cool part: the straps and thumbscrews always stay attached to the chassis, so there's nothing to lose between heats. And, needless to say, there are no plastic clips, hook-and-loop straps, or body pins to wrangle with. The chassis has two extra slots on its right side for two additional battery-mounting options. All it takes to transfer the pack hold-down to one of the optional locations is the removal of two screws.

SOURCE GUIDE

XRAY distributed by **SERPENT INC. USA,** West Park Center, 2830 NW 79th Ave., Miami, FL 33122; (305) 639-9665; fax (305) 639-9658; www.hudy.net; info@serpent-usa.com.

Team Losi Dirt Spec Triple-X and Triple-XT

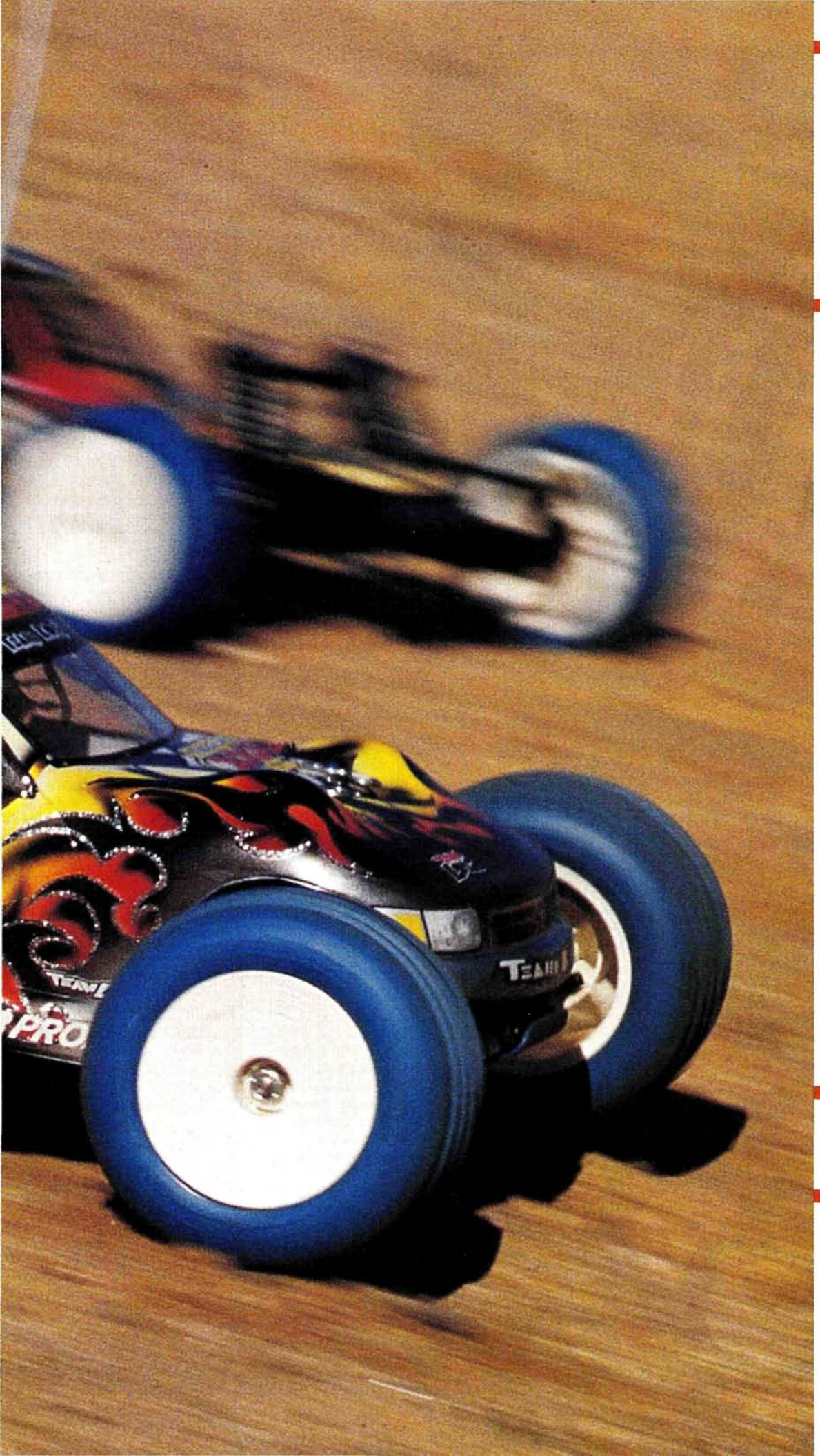


Losi lowers the cost of Triple-X tech

by Derek Buono

All electric off-road RC racers are familiar with the Team Losi Triple-X and Triple-XT—the buggy and truck that many consider to be the state of the art in their respective categories. As no-holds-barred competition kits, they make few concessions to cost savings; they're meant to win races. And although they cost about the same as other similarly equipped vehicles, they aren't what you'd call inexpensive. Team Losi plans to bring down the cost of speed with a cost-controlled off-road racing class dubbed "Dirt Spec."

PHOTOS BY WALTER SIDAS



DATA CENTER

VEHICLE TYPE 1/10-scale 2WD off-road race buggy and truck

BEST BUYER Sport to mid-level racer who wants a high-performance vehicle but not a high price

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Excellent
Parts fit/finish Very good
Durability Excellent
Overall performance Very good

SPECIFICATIONS

MANUFACTURER Team Losi
MODEL Triple-X Spec buggy/truck
DISTRIBUTOR Horizon Hobby
SCALE 1/10
EST. STREET PRICE (buggy/truck) $149.99/$159.99

DIMENSIONS
Wheelbase buggy–10.79 in. (274mm); truck–11.05 in. (280.7mm)
Width (F/R) buggy–9.66/9.61 in. (245.3/244mm); truck–12.7/12.9 in. (322.6/327.7mm)

WEIGHT
Total, as tested buggy–54.1 oz. (1,545g); truck–62.8 oz. (1,796g)

CHASSIS
Type Composite tub
Material Stiffezell

DRIVE TRAIN
Transmission 3-gear
Drive shafts Telescoping universals
Differential Ball
Bearing type Metal-shielded ball bearings in transmission; metal bushings in hubs

SUSPENSION (F/R)
Type Lower A-arm with adjustable upper link
Damping Oil filled, coil-over aluminum shocks

WHEELS
Type (F/R) 2.2/2 in. (buggy), 2.2-in. dish (truck)

TIRES
Type (F/R) Losi ribbed/Losi studs in blue Spec rubber

LIKES

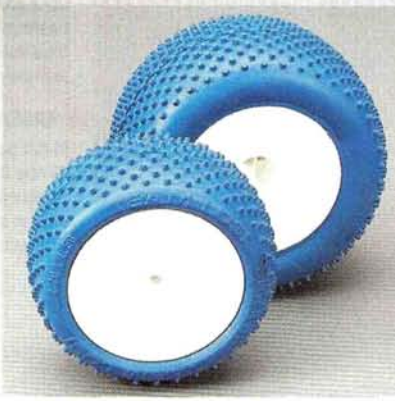
- Rock-solid handling.
- Bearings in tranny.
- Blue spec tires.
- Instructions and parts fit.

DISLIKES

- Metal bushings.
- Plastic bushing in diff.
- Turnbuckles hexes are too small.
- Tire odor.

The molded blue rear guard and blue-anodized shocks look distinctive. The plastic rear sliders are better than dog-bones and performed better over choppy sections. Also notice the metal bushings in the rear hub carrier.

The Spec versions' molded blue components help you distinguish them from the full race versions.



Team Losi rigorously tested the Spec tires to ensure that the blue compound would offer traction and durability. But they smell horrible!

YOU'LL NEED

- 2-channel transmitter and receiver
- Steering servo ■ ESC ■ Motor ■ 6-cell pack
- Charger ■ Polycarbonate-compatible paint
- Tire glue

building & setup tips

The kits have almost all the same components and can be built as easily as every other Losi kit. Losi may have the best directions out there; they combine accurate CAD drawings and helpful written instructions. As always, some steps require some special attention.

Pre-thread the chassis parts. The chassis and some of the other parts are made of Losi's special plastic that can be difficult to thread screws into. A tapping screw is included, however, and I strongly recommend that you use it in every hole. It may add to the building time, but it makes assembly much easier. To make it even easier, put a dab of white grease on the screws when you thread them in (the lubrication saves wear and tear on your wrist).

Plastic sliders. These work quite well but are slightly more difficult to assemble because you have to insert a metal crosspin. If you have access to a rotary tool and an old pair of pliers, you might want to slot one end of the pliers so that you'll be able to squeeze the pin through the sliders more easily. "Pit Tips" in the February 2001 issue shows an illustration of how to modify the pliers.

Bearings. If you can spring for the extra eight bearings for the hub carriers, install them at the start, unless the track you plan to race at prohibits them. Bearings will lengthen the life of the sliders, reduce friction and maintenance and increase speed and run time.

Ride height. It's always fun to see a buggy or truck jacked up, but when racing, this hampers performance. Set the front arms so that when you pick up the car and drop it from about 1 foot off the ground, the arms sit level with the front kick-up. Set the rear in the same way, but the sliders will either sit parallel with the ground or will be slightly below parallel. This will allow the suspension to have a full range of motion.

Battery position. Altering battery position is a simple tuning aid: to increase traction in the rear and provide less steering, move the battery rearward; for more steering, move it forward. Start with the battery in the center and move it forward or backward to suit track conditions.

The centerpieces of the class are the Dirt Spec Triple-X and Triple-XT. They cost significantly less than the "standard" versions but deliver all the Triple-X platform's important innovations. In addition to cutting down the getting-started costs of competition, the Dirt Spec class reduces the cost of staying competitive by eliminating the "tire wars." Team Losi's unique blue tires are the only ones legal for Dirt Spec, so there's no advantage to buying every tread pattern in the shop in an attempt to find the perfect rubber for the day's conditions. Even if spec racing isn't in your future, the Dirt Spec buggy and truck are a less expensive way to get Team Losi performance on your side—at least, that's the plan. I tested both Dirt Spec machines to see whether they really do have the Triple-X mojo.

KIT FEATURES

• **Chassis.** The Triple-X molded chassis is made of Losi's Stiffezel fiber-reinforced plastic. Its upswept edges increase ground clearance on hard cornering and reduce the vehicle's center of gravity. The chassis is modular; the main chassis holds the centerline battery compartment and has space for an electronic speed control and receiver; the front section is basically the front suspension, consisting of the front bulkhead and suspension mounts; the rear sub-assembly can be removed with the transmission and suspension intact. The steering servo is firmly planted on the main chassis and held by a molded chassis brace/upper deck. Both Specs come with a molded battery hold-down that has a foam liner to cushion the cells.

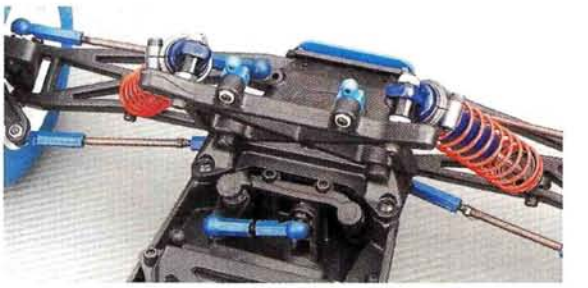
• **Drive train.** Team Losi used to equip its buggies and trucks with their own unique transmissions and ratios, but the Triple-X series debuted a new transmission that is shared by the buggy and truck and has a 2.43:1 ratio that can be geared to suit large truck tires as well as smaller buggy treads. To prevent tail-first crashes from tweaking the aluminum motor plate, the rear bumper/motor guard is a molded cage that is not connected to the motor plate. This setup allows the motor plate to be isolated from impacts that could tweak it.

The dual-pad slipper clutch is now a Losi standard (as originated by the Kinwald Edition Double-X). The dual pads offer a more linear, smoother action. The slipper is mounted on a machined-steel top shaft and top gear that spins the bottom-mounted ball diff by means of a plastic idler gear. The diff has plastic outdrives, and may be adjusted from the outside. All the tranny gears spin on ball bearings, but a plastic bushing is supplied for the diff gear. Instead of steel universal-joint axles, plastic telescoping universals are supplied. The sliders are lighter than the steel universals, and that's good for the stock-type powerplants Dirt Spec racers will use, but Losi mainly includes them to reduce cost. The sliders' metal stub axles ride on metal bushings in the rear carriers.

• **Suspension and steering.** The Dirt Spec vehicles use exactly the same parts as the standard Triple-X series kits, so they have the same geometry. This means that the Dirt Spec buggy and truck can handle any kind of track and surface condition as well as the full race versions. The molded front shock towers on the truck have four shock-mounting positions while the fiberglass buggy tower offers two positions. This, coupled with the three locations on the arms, means there are ample tuning options without being overwhelming. Caster is fixed and may be adjusted by changing the front spindle carrier, but the stock 25

Above: the buggy has new body mounts that allow the body's rear to sit lower. The new position made it a little harder to get the mounting pins in, but the body is held firmly in place.

Left: the buggy (shown here) and truck (opposite page) have the same major components, but the truck has longer suspension arms, front and rear, to stretch it to the legal limit.



Up front, the servo is held on the chassis with an upper brace. Note the turnbuckles' small gripping area; if you aren't careful, they're easy to strip.

JR XR3 and XR2 transmitters
Both of these computer radios have features usually reserved for more expensive models, including digital trims, adjustable dual rate and an LCD screen. The XR3 also has FM, 3-channel capability and 3-model memory; XR2 has AM, 2 channels and 2-model memory.

Novak Fusion ESC
The dual-profile Fusion suits both stock and modified motors. The stock settings give maximum punch while the modified setting smoothes out the power. The Fusion is rated at 240 amps and can handle 6 or 7 cells and motors down to 12 turns with a 6-cell. It also has a brake-light lead to power optional brake lights.

Trinity Ex-Spec stick pack
This pack is a perfect match for spec racing. With an ample 1300mAh, it provides plenty of punch and run time for stock or mild modified motors.

Trinity 5-degree Spec and Chameleon Pro motors
Both are well suited to spec racing because each has identifiable features that are easy to tech. The 5-degree Spec appeals to the budget-minded, but I think that the 19-turn Chameleon would be best for the spec class—more speed and thrills while still being a conservative choice.

degrees should provide good low-speed steering and not get out of shape in the bumps. You'll find adjustable steel turnbuckles in the front and the rear of both vehicles. Losi's standard bottom-loading shocks feature a double O-ring seal and Teflon pistons, and they're anodized blue to match the Spec tires. Hardcore racers may complain that they aren't hard-anodized, but most won't notice a difference (and they are a cool blue!). Silicone shock oil is included, and traditional clamp-style shock collars adjust preload.

Steering is handled by an angled bellcrank system. With the bellcrank at the same angle as the front spindle carriers, bump-steer is eliminated. The system rides on a set of plastic bushings.

• **Body, wheels, and tires**. The truck's low-slung Lexan shell radiates muscle and looks very aggressive. The buggy benefits from the new body-mount location on the chassis' trailing edge. Instead of extending over the transmission, it stops at the rear shock tower. The result is a lower body that fits like plastic wrap on a hot dish. Both bodies include a wing, window masks and a set of stickers.

The molded, bright blue rubber tires really stand out and have been thoroughly tested so they actually work and don't just look pretty. They do have a weird smell, though. Bright white Losi dish wheels contrast nicely with the tires—eye-catching, both on and off the track.

PERFORMANCE

I have a lot of experience with the race versions of the Triple-Xs and wasn't surprised when these Spec editions exhibited the same excellent track manners. The first thing that you notice is that their handling is extremely smooth, even over the rough stuff. The Spec tires hooked up well on the dirt to provide excellent traction—and attract the stares of curious onlookers.

I opted for Trinity motors and batteries: a Spec 5-degree motor and spec pack for the buggy and a Chameleon Pro and Spec pack for the truck. This combination seemed to fit the reduced-cost racing Losi is trying to push. Both motors offer easy teching and still provide plenty of speed. The Chameleon is faster and reached a higher top speed, but both accelerated out of the hole quickly and stayed straight. Jumping was a breeze, and attitude adjustments were easy to make with simple throttle/brake inputs. On-power steering is one of the Specs' strong points; the two obeyed my inputs and took the line I wanted to keep. Thanks to the Novak Fusion speedo, braking was precise. Whenever I need to swing the rear around, a quick tap of the brake and around it went. After a few runs, I checked the metal bushings (which all four wheels ride on). As I expected, they had a little more play than they started with. Bearings would have cost more to supply, but depending on the Spec rules, the kits' bushing might be replaced with bearings. I suggest that bearings will save money in the long run by making the buggy and truck more efficient and reducing the need for maintenance.

THE VERDICT

It was no surprise to me that the Triple-X Spec buggy and truck really are pro-level kits at an entry-level price. They cost a little more than true "entry-level" kits, but they offer race-winning technology and performance that are hard to match. And with just a few inexpensive items, they can easily be upgraded to full race attire. Even if there isn't a local spec class, if you're thinking about getting into racing, Losi's Triple-X Spec buggy and truck will save you money and will perform on the track. ■

Dirt-Spec Rules

Losi is spearheading the development of the Dirt Spec class with its own kits but has drafted rules that allow other popular trucks to compete. The items listed as "legal" are only meant to be suggestions; individual tracks will tweak the rules to suit whatever works best for their racers.

DIRT SPEC CHASSIS

Any production 2WD kit listed at no more than $260 (buggy) or $270 (truck) including, but not limited to, the following:

- Associated—B3 sport buggy, T3 sport truck;
- Team Losi—Triple-X-Spec buggy, Double-X buggy; Triple-X-Spec truck, Double-XT truck;
- Traxxas—Bandit buggy, Rustler truck.

MOTORS

Any stock non-ball-bearing type with a list price of no more than $40.

BATTERY PACKS

Any 6-cell mass-produced pack listed at no more than $30 and including, but not limited to, the following:

- Associated—Cyberpack1400 Sport;
- Dynamite—Dyna-Sport 1500, Dyna-Sport 1700;
- Trinity—Amp Max II 1500, Zip Pack, Thunder Sport KR1400.

SPEED CONTROLS

Any production electronic speed control listed at no more than $130 and including, but not limited to, the following:

- Dynamite—Power Pulse;
- LRP—Runner, Sport, Super Sport;
- Novak—Duster; Dually; Fusion;
- Tekin—408S, 410S2, 412P, 2210;
- Traxxas—XL-1.

TIRES

Buggy and truck—Team Losi (Blue color) Dirt Spec front and Dirt Spec rear.

SOURCE GUIDE

DYNAMITE
distributed by
HORIZON HOBBY

HORIZON HOBBY
4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511; fax (217) 352-0355; www.horizonhobby.com

JR RACING
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NOVAK ELECTRONICS INC.
18910 Teller Ave., Irvine, CA 92612; (949) 833-8873; fax (949) 833-1631; www.teamnovak.com.

TEAM LOSI
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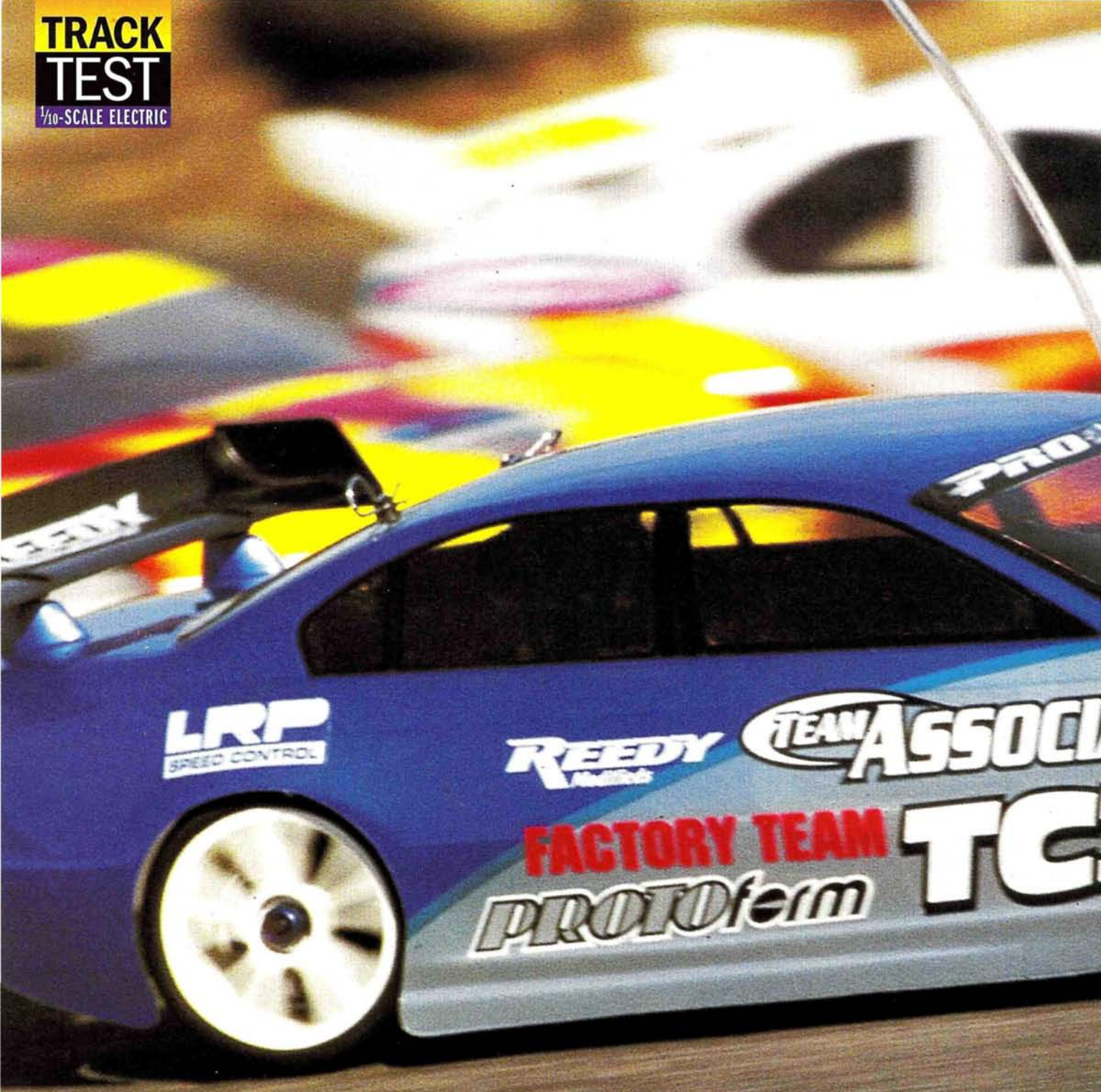
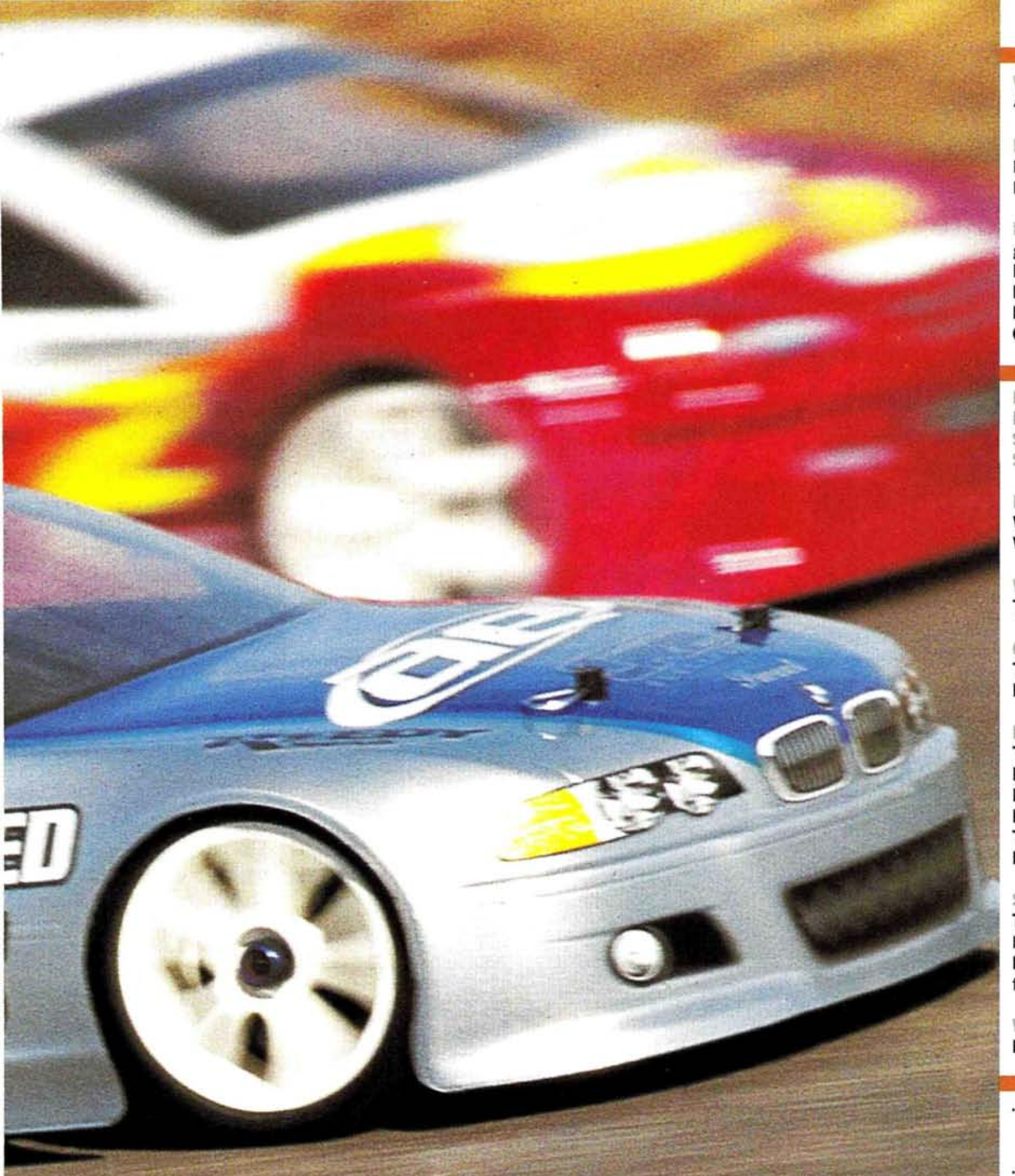
TRINITY PRODUCTS INC.
36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.



Associated Factory Team TC3

Instant world-class racer. Just add electronics.

by Peter Vieira



While some of us are content to get by with steel turnbuckles,

plastic-body shocks, shielded bearings and the usual good-enough stuff included with the typical competition touring car, most racers find themselves picking up a set of titanium turnbuckles, threaded-body aluminum shocks and a passel of other upgrade items before the shrink-wrap is even off the kit box. With that customer in mind, Team Associated has added the TC3 to its lineup of Factory Team-edition kits. Like the Factory Team RC10B3, T3 and GT before it, this latest version of the TC3 includes virtually all of Associated's go-fast parts as standard equipment—from molded-graphite chassis components to swaybars to Teflon-sealed bearings. It's no secret the TC3 is already a class-leading performer in Racer and Team editions. Now we'll see just how much better it can get.

PHOTOS BY WALTER SIDAS

DATA CENTER

VEHICLE TYPE 1/10-scale electric 4WD competition touring car

BEST BUYER
Experienced racers, or anyone who likes having the best stuff

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Excellent
Parts fit/finish Very good
Durability Very good
Overall performance Excellent

SPECIFICATIONS

MANUFACTURER Team Associated
MODEL Factory Team TC3
SCALE 1/10
STREET PRICE $319

DIMENSIONS
Wheelbase 10.18 in. (259mm)
Width 7.5 in. (190mm)

WEIGHT
Total, as tested 51.6 oz. (1,464g)

CHASSIS
Type Molded semi-tub
Material Graphite-reinforced plastic

DRIVE TRAIN
Type Full-time, shaft-driven 4WD
Primary Pinion/spur gear
Drive shafts MIP aluminum CVDs
Differentials Ball
Transmission ratio 2.5:1
Bearing type Teflon-sealed

SUSPENSION
Type (F/R) Lower H-arm with turnbuckle camber link
Damping Aluminum, threaded-body, fluid-filled VCS shocks

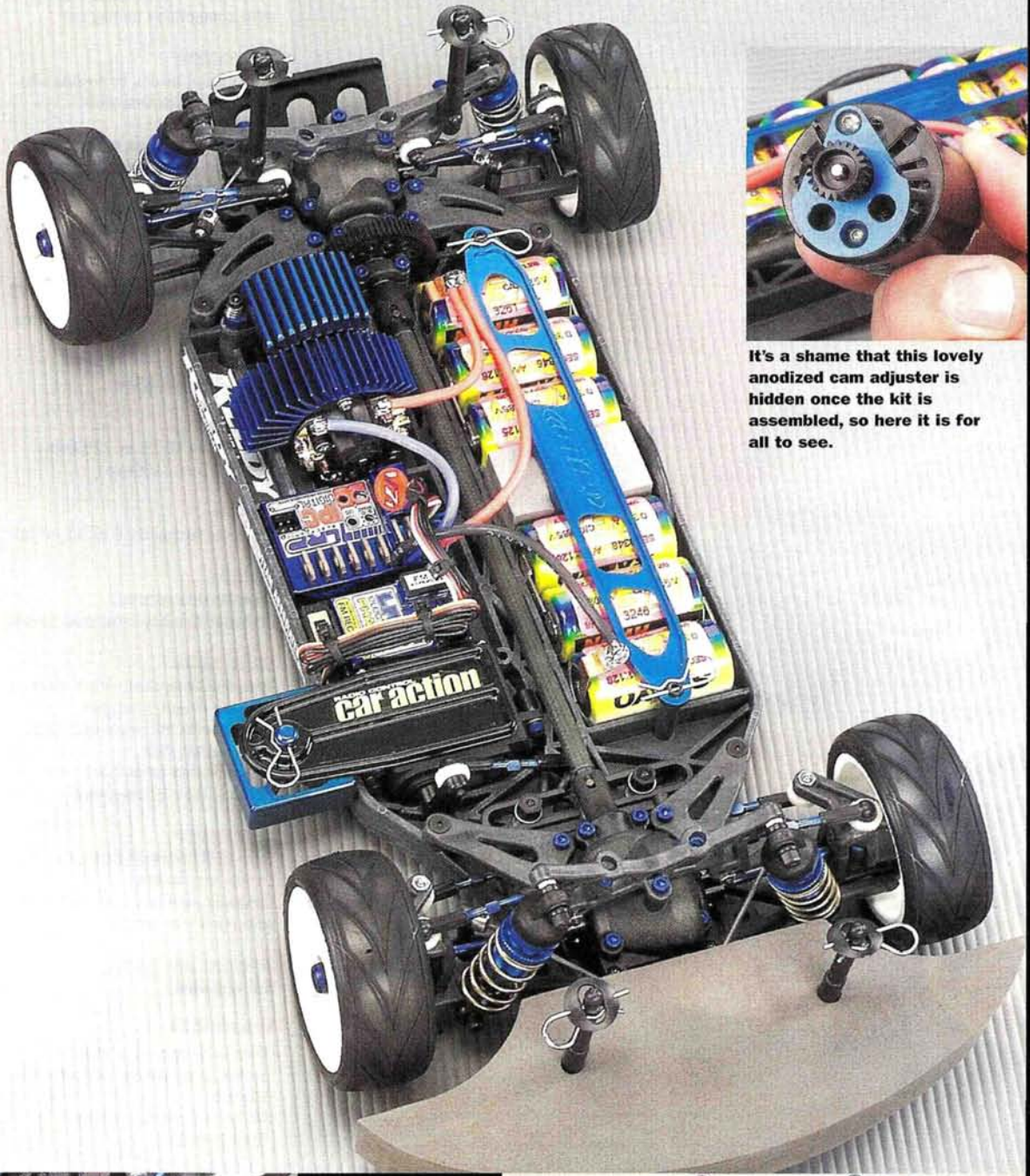
WHEELS AND TIRES
Not included

LIKES

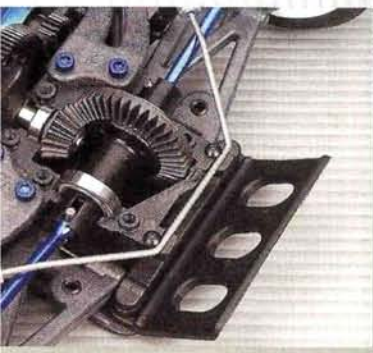
- Everything you could want for racing (plus some style stuff) is in the box.
- No belts to stretch or skip.
- Easy to drive.

DISLIKES

- Removal of waste material left gaps in the transmission cases.
- Swaybars pop out easily.
- Hub carriers required minor hand-fitting for free suspension action.



It's a shame that this lovely anodized cam adjuster is hidden once the kit is assembled, so here it is for all to see.



Left: the bevel gears are precisely shimmed—don't second guess the manual! Note the screw heads that contain the sway bar (barely). Right: threaded-body shocks are standard, as are MIP CVDs.

building & setup tips

Associated's instructions are now among the best in the business, but I always learn something new worth passing on after I build a kit. Here are a few things to watch for when you build your TC3.

Bag B, Step 1. You'll need a strong pair of diagonal cutters to remove the sprue from the suspension arms. Alternatively, you can use a cutoff wheel in a rotary tool to remove the waste. Just be careful not to cut off the swaybar pivot-balls or front suspension-arm caps.

Bag C, Steps 9, 10, 11. Carefully deburr the ends of the aluminum shafts and the bores of the spur-gear mount and drive cups. This will make it easier to slide the parts together. Remember to install the indicated shims as you build.

Bag C, Steps 14 and 16. Don't pack the gears with grease; only apply a thin film, or you will increase parasitic drag. Because I wanted to build the kit exactly as Associated suggests, I used the included Stealth diff lube on the gears, but I highly recommend Aero-Car gear lube for all gear tranies.

Bag E, Step 4. I had to trim just the slightest bit of material from the sides of the hub carriers so they would fit the suspension arms without binding; a few swipes with a file was all it took.

Bag G, Step 3. The text doesn't mention shock limiters, but if you look closely at the third illustration, you'll see limiters stacked up under the piston. Install four in the front and two in the rear.

Bag K, Step 3. Tiny screws are used to capture the swaybars, but the swaybars are easily popped out. Adding washers under the screws solves the problem, but you'll have to cut a washer down to fit under the screw that's installed next to the "bell" of the transmission housing.

YOU'LL NEED ■ 2-channel transmitter and receiver ■ Steering servo ■ Electronic speed control ■ 190mm body and finishing supplies ■ 6-cell battery ■ Charger ■ Wheels ■ Tires ■ Pinion gear

FACTORY OPTIONS ■ Factory Team blue-anodized shock caps (4)—part no. 1598 ■ TC3 tuning springs—various part numbers ■ Steering rack cover—3857 ■ Front block carriers, 0-degree graphite—3869 ■ Front block carriers, 2 degrees—3870 ■ Front block carriers, 4 degrees—3872 ■ Front one-way differential ring gear—3939 ■ Front one-way outdrives—3966

KIT FEATURES

• **Chassis.** The Factory Team TC3's molded semi-tub chassis is made of graphite-reinforced plastic instead of the nylon-reinforced stuff used with the Racer and Team kits. Associated also tweaked the mold a little bit by adding pads for droop screws (more on that later). Otherwise, the chassis has all the usual TC3 features: seven cell slots for three pack-mounting options (full forward, full aft, or split), a deeply molded, trussed center spine, wing-like front and rear braces, an integrated motor mount and a rigid battery strap. This time around, the strap is a machined-aluminum piece with an engraved "AE" logo; the Racer and Team kits use a plastic strap.

A molded droop gauge is included with the Factory Team kit; its an invaluable tuning tool.

• **Drive train.** A full-time 4WD shaft system is the TC3's most obvious feature. The floating shaft uses dogbone ends to join the front and rear gearboxes to house a simple ring-and-pinion gear system. The Factory Team car's front and rear ball differentials are equipped with plastic outdrives to decrease rotating mass, and blue-anodized aluminum MIP CVDs are standard equipment at both ends of the car. Teflon-sealed bearings keep everything spinning smoothly, although I did experience some "lumpiness" in the drive train when it was first built (see "Building & setup tips"). Aluminum drive hexes are standard and are finished with "Factory Blue" anodizing.

The blue treatment is also given to the motor clamp/heat sink, and an additional clip-on heat sink is included. The outside clamp screw is spring-loaded to prevent damage to the clamp or warping of the chassis due to overtightening.

• **Suspension.** The Factory Team TC3's suspension arms include thick down-travel adjustment (droop) screws, but they have identical geometry to previous TC3 arms. Lots of touring cars use droop screws, but Associated has the best system I've seen. The pads for the screws protrude only slightly from the chassis, so they won't flex much, and the screws themselves have smooth, rounded bottoms that won't gouge the chassis. Also, because the screws are quite large in diameter (they take a 3/32 wrench), they aren't likely to strip or get pushed through the arms.

The front end employs the usual steering knuckles and C-shaped hub carriers (steering blocks and block carriers, in Associated parlance). The block carriers have a pronounced "chin" that places the outboard hinge pin almost directly over the center of the rim's width, which makes for a highly active suspension. The hinge pins are secured with setscrews in the block carriers, which take E-clips out of the picture and gives the arms a sleek look—thanks to the flush ends of the hinge pins. Steel bushings allow the steering blocks to pivot smoothly and maintain precision, and the upper kingpin doubles as a mounting point for the camber link. Because it's a Factory Team kit, the TC3 is outfitted with blue titanium links all around, including the link that joins the servo to the steering rack.

The inboard hinge pins are held in place by interchangeable mounts that can be set for 2 or 3 degrees of rear toe-in and 0 or 2 degrees of rear anti-squat. Up front, the arm mounts set kickup (0 or 2 degrees), and optional block carriers with 2 and 4 degrees of caster can be installed to adjust caster.

Associated VCS (volume compensation system) shocks are the heart of the suspension system, and the Factory Team TC3 gets Associated's blue-anodized, threaded-body versions. The VCS setup uses a foam element for volume compensation, and a selection of Teflon pistons are included for damping adjustments. Knurled preload collars with O-ring "grippers" turn easily (but not too easily), and the shock shafts have Associated's tough and slippery Unobtanium coating for long life and smooth action. Molded graphite shock towers complete the suspension, and a pair of swaybars are standard equipment.

• **Steering.** The TC3 is well-known for its rack-type steering system that slides on four ball bearings in Factory Team trim. The system is compact and simple, but its main benefit is "true Ackerman." The steering geometry has been precisely configured so the outside and inside front wheels track properly in a corner (as you know, the wheels on the outside of the turn carve a wider arc than those on the inside). By getting the angles just right, the TC3 minimizes scrub in turns and helps the car feel more hooked up. For more aggressive steering, you can install spacers beneath the steering-rack pivot balls.

KO Propo EX-11 Presto transmitter

The Presto is all the transmitter I could ever need. It has all the features I use most often from KO's top-o'-the-line Mars (endpoint adjustments, model memory, dual rates, exponential and the usual trims) at a lower price point and wrapped in a very comfortable case.

LRP Phazer receiver

What's little and blue and catches radio waves? OK, I guess that description would apply to a Smurf wearing a Walkman, but I was talking about LRP's Phazer receiver. The Phazer's metallic blue case is claimed to reduce interference; all I know is that it looks factory. The top-exit antenna is a nice touch too.

LRP V7.1 ESC

LRP's chip technology makes it easy to tailor the V7.1's throttle feel for punch or efficiency, and it also sets the current limiter value. Since Associated's team drivers run LRP electronics, it was only natural to outfit my TC3 with the same gear.

Reedy Sanyo 3000 NiMH pack

You can run Reedy batteries in any car, of course, but if you're running Associated, then you just have to run the stuff! I went with Sanyo cells this time around and installed six R3K matched cells in a 3x3 layout.

Reedy Fury 12x3 modified motor

Mike Reedy's motors have 22 IFMAR Worlds titles to their credit, so I'm sure anything he winds will be good enough for this club hack. A 12-triple is plenty for me on a tight carpet track.

Hitec HS-625MG steering servo

Hitec guarantees the 625MG's gear train against breakage, so it's got to be tough, and with a claimed 91 oz.-in. of torque and 0.15 second transit time at 6 volts, it's more than enough servo for my needs.

THE COMPETITION

	Drive shafts	Chassis material	Bearing type	Shocks	Body inc.	Front one-way	Street price**	Reviewed
Associated Factory Team TC3	**MIP CVD**	**Molded graphite**	**Teflon-sealed**	**Threaded alum.**	**No**	**No**	**$319**	**5/01**
HPI RS4 Pro 2	MIP CVD	Carbon-fiber plate	Metal-shielded	Aluminum	No	No	$219	5/99
Schumacher Axis 2	Plastic UJ*	S1 composite	Metal-shielded	Aluminum	No	No	$219	3/01
Tamiya TB Evolution	Steel UJ*	Carbon-fiber plate	Rubber-sealed	Threaded alum.	No	Yes	$539	3/01
Yokomo MR-4 TC Worlds	Aluminum UJ*	Molded graphite	Rubber-sealed	Threaded alum.	Yes	Yes	$299	4/01

*Not all competitive cars are listed; the category is too large to list all vehicles. *UJ=Universal joint **Estimated; price varies with dealer*

• **Body, wheels and tires.** Sorry, not included. Associated figures you'll want to make your own body choice, and you've probably already invested in tires and wheels if the Factory Team TC3 isn't your first competition car.

Associated includes a dummy transponder because you bought the Factory Team TC3 to race, but the aluminum battery brace is strictly for cool. Ok, it dissipates some heat, but is that really why you want one?

PERFORMANCE

In addition to the standard starting setup you'll have after you build the Factory Team TC3 according to the instructions, the manual lists a bumpy-track setup, a setup for carpet racing with foam tires, and the 2000 IFMAR Worlds setup with a front one-way. Unfortunately, I didn't notice this info until I had completed the car with the standard settings and was on my way to test on carpet! I figured I should get a feel for the TC3 on pavement even if I wasn't going to race on blacktop that day. The Reedy motor had plenty of rip, and it wasn't hard to break the tires loose if that's how you want to drive. In race mode, I found the TC3 very easy to drive, showing no tendency to seesaw between hook and push (unless I made absolutely no effort to drive smoothly) and a flat-as-a-pancake cornering attitude (swaybars will do that).

Still, I know that any competent touring car on a wide open parking lot tends to feel pretty good; it takes the threat of solid barriers, the tone of transponders crossing a loop and a 5-minute clock to bring out the real capabilities of a race car. And for that, I turned to the RC Madness carpet track (Enfield, CT). Although I didn't have the foresight to run the Associated carpet setup, I did use the "Greg Vogel setup": white springs and purple foam tires up front; yellow springs and magenta foams in the rear; no swaybars; and 80WT oil all around. Frankly, I couldn't believe how well the car worked; it was easily the most dialed car I've ever driven.

The Factory Team turned in with good grip; the rear end drifted ever so slightly under hard cornering instead of scrubbing speed; and it tracked as straight as an arrow when I jumped on the throttle. After a couple of heats, the suspension settings drifted because of break-in, and the TC3 became very loose. A quick reset with a turnbuckle wrench and a camber gauge was all it took to get back in business. By the end of the day, I was turning laps that were nearly 3 seconds faster than when I had started, and I attributed that to the TC3's easy-to-drive feel. All I had to worry about was picking a decent line.

THE VERDICT

The Factory Team TC3 is has some nice eye candy with its blue battery brace and screw kit, and the increased durability of the Unobtanium shock shafts and titanium turnbuckles is certainly welcome. But for the racers who will no doubt flock to the Factory car, the best features are the stiffer graphite components that distill every nuance of suspension setup into performance, and the extra adjustability made possible by the new droop screw system, swaybars and threaded shock bodies. The Factory Team is not a fantasy "full option" car that leans more toward "colorful" than "competition"; it really is a better TC3. ■

SOURCE GUIDE

AERO-CAR TECHNOLOGY
P.O. Box 336, Western Springs, IL 60558-0336; (708) 246-9027.

HITEC RCD INC.
12115 Paine St., Poway, CA 92064; (858) 748-6948; fax (858) 748-1767; www.hitecrcd.com.

KO PROPO USA INC.
16012 South Western Ave., Ste. 308, Gardena, CA 90247; (310) 532-9355; fax (310) 532-9354; info@kopropo.com; www.kopropo.co.uk.

LRP ELECTRONIC
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TEAM ASSOCIATED
3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744; www.teamassociated.com.

TRACK TEST
1/8-SCALE NITRO

Mugen **MBX-4 XR**

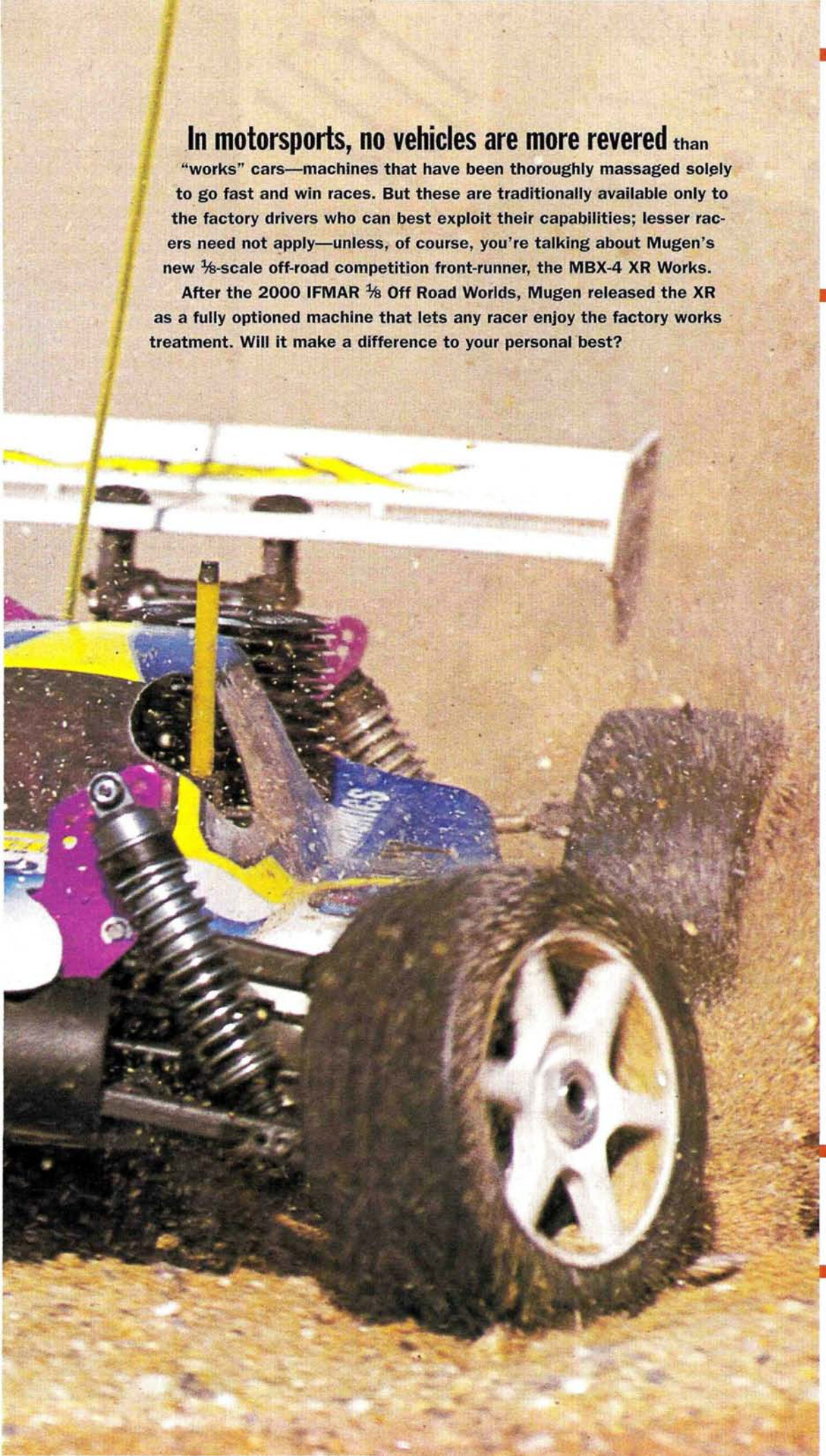
XR—as in Xtra Racing stuff

by Derek Buono

PHOTOS BY WALTER SIDAS

In motorsports, no vehicles are more revered than "works" cars—machines that have been thoroughly massaged solely to go fast and win races. But these are traditionally available only to the factory drivers who can best exploit their capabilities; lesser racers need not apply—unless, of course, you're talking about Mugen's new 1/8-scale off-road competition front-runner, the MBX-4 XR Works.

After the 2000 IFMAR 1/8 Off Road Worlds, Mugen released the XR as a fully optioned machine that lets any racer enjoy the factory works treatment. Will it make a difference to your personal best?



DATA CENTER

VEHICLE TYPE 1/8-scale nitro racing buggy

BEST BUYER Experienced nitro racer who wants the ultimate off-road buggy

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Satisfactory
Parts fit/finish Very good
Durability Excellent
Overall performance Excellent

SPECIFICATIONS

MANUFACTURER Mugen Seiki
MODEL MBX-4 XR Works
SCALE 1/8
STREET PRICE $565

DIMENSIONS
Wheelbase 13.04 in. (326mm)
Width (F/R) 12.20/11.76 in. (305/295mm)

WEIGHT
Total, as tested (w/empty tank) 124 oz. (3,540g)

CHASSIS
Type 3.25mm plate with aluminum radio tray
Material T7075 aluminum

DRIVE TRAIN
Type Shaft-drive 4WD
Primary 14T clutch bell/46T spur
Drive shafts (F/R) Universal axle
Differentials (F/R) Sealed 4-gear bevel
Primary drive ratio 3.29:1
Drive-train ratio (F/R) 3.33:1/3.45:1
Final drive ratio (F/R) 10.95:1/11.35:1
Bearing type Rubber-sealed

SUSPENSION
Type (F/R) Lower A-arm w/ adjustable upper link/lower H-arm with adjustable upper link and toe-in
Damping Hard-anodized, oil-filled, coil-over aluminum shocks

WHEELS
Type 6-spoke plastic

TIRES
Type Pro-Line Crime Fighter Compound M2

ENGINE AND ACCESSORIES
Not included

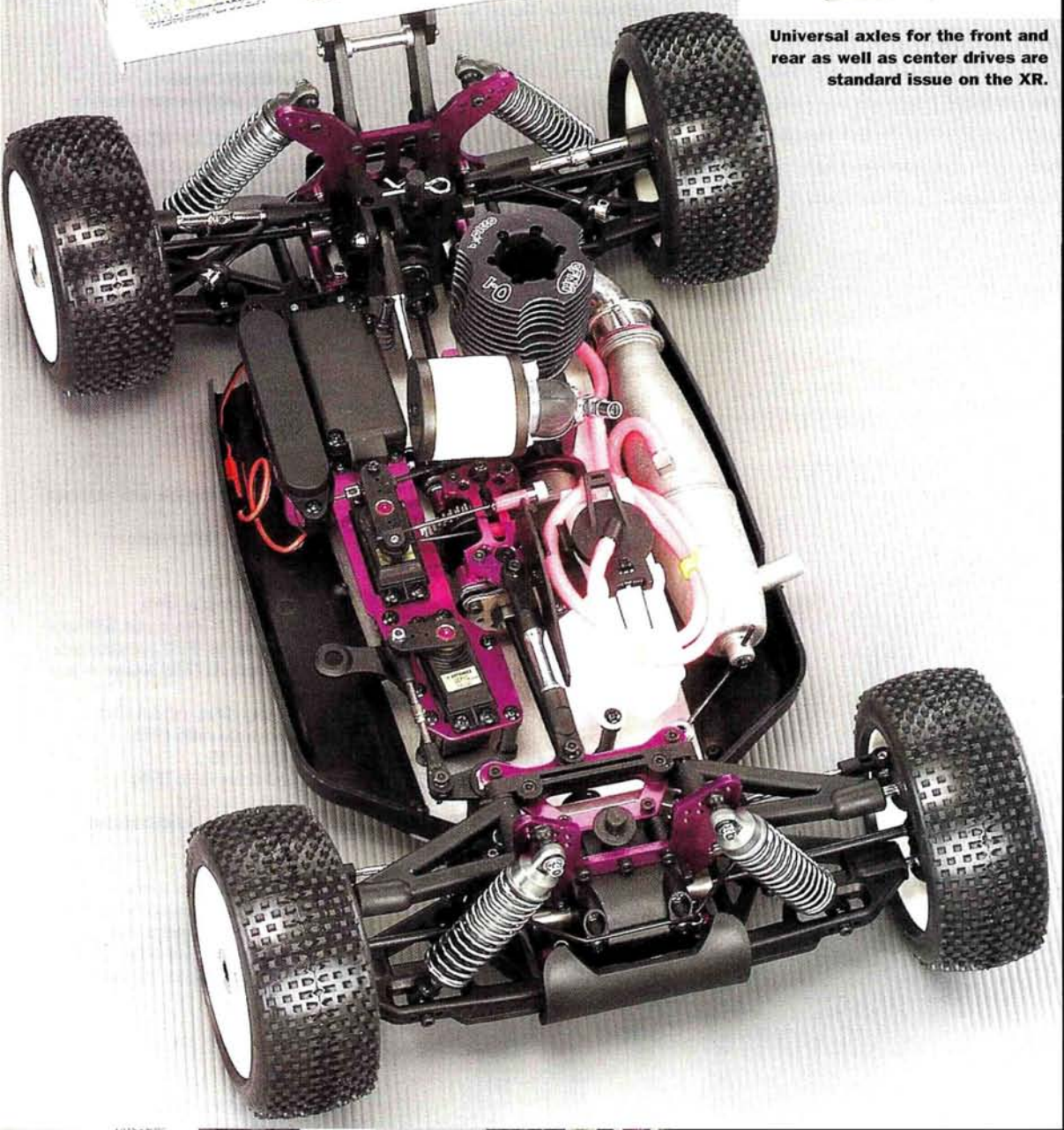
LIKES

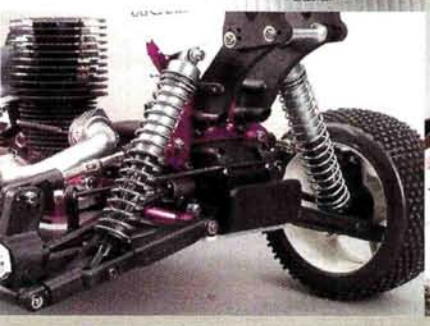
- 2-piece center diff mount makes diff access easy.
- Bearing steering increases precision.
- Universal axles reduce backlash.

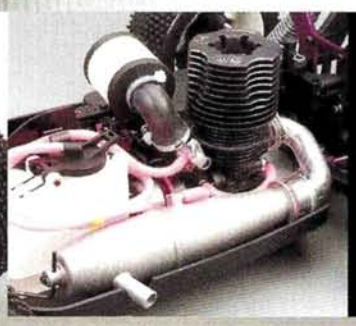
DISLIKES

- Diffs require break-in to mesh smoothly.
- Parts bags and instruction weren't well organized.
- Chassis edges are sharp.

Universal axles for the front and rear as well as center drives are standard issue on the XR.







Far left: the rear suspension uses a hinge-pin design, but toe-in is adjustable. Two styles of hub carrier are included in the kit. Front and rear swaybars help keep the chassis level in high-speed corners. Left: combined with the Rex tuned pipe and exhaust header, the power from the OFNA/Picco seemed endless. A larger cooling fin and over 2hp at the mercy of my heavy finger made for one fast car.

YOU'LL NEED ■ 2-channel transmitter and receiver ■ Steering servo ■ Throttle servo ■ Receiver pack ■ .21 engine (pull-start or non-pull-start) ■ Pipe and exhaust header ■ Fuel ■ Starter box (if you use a bump-start engine) ■ Polycarbonate-compatible paint ■ Thread-locking compound

building & setup tips

The instructions were not the most beginner-friendly I have seen. Some steps were out of order, and that contributed to my confusion while building. Experienced builders should be able to get through the kit easily, but beginners may need help. The parts-bag organization was also far from perfect. I recommend that you open every bag before you start because at times, the instructions call for you to go part hunting. All the parts were in the kit but not always where I thought they would be. Here are a few steps that need extra attention:

BUILDING

Chassis prep. The edges of the chassis were very sharp. Although not entirely necessary, it's a good idea to file them before you start.

The diffs. The diffs were very easy to assemble, but be careful not to mix up the front and rear rings and pinions. They are color-coded for quick identification, but if you are in a hurry, you could make a simple mistake. Keep all the parts for the front diff away from one another, and you will avoid confusion.

Differential gear mesh. When assembling the car as the directions show, you are directed to install two diff shims to tighten the gear mesh. This makes for one notchy diff, and it almost feels as if you built something incorrectly. Chris Moore of Mugen reassured me that they would be broken in after two tanks. I left the shims out for break-in because I didn't want to stress my new engine. Once it had begun to wear in, I put the shims in. Chris also stresses that if you don't use the shims, there's a greater possibility of the teeth skipping when your XR goes over big bumps.

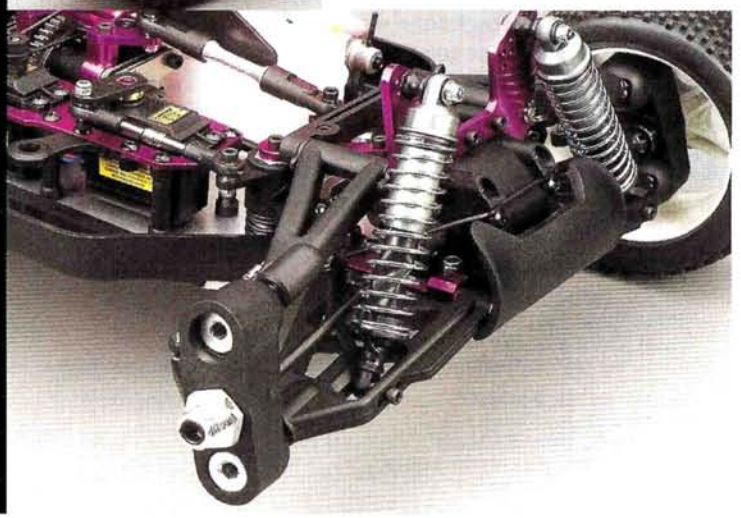
Lube the threads—especially when assembling the pivot balls. Adding some grease

when threading them in makes it much easier to thread the plastic for the first time.

Servo-saver. In step 5, you are directed to assemble the servo-saver. For some reason, they don't tell you to install the ball ends until step 12. This makes installing the ball ends on the servo-saver more difficult. Install the ball ends when you assemble the servo-saver.

Break-in. You should always break in a nitro engine to ensure long trouble-free operation, but with a buggy of this caliber and an expensive engine, follow the procedure recommended in the engine manual. I usually let the engine idle as rich as possible for one tank and allow it to cool completely before doing the same thing for three full tanks. Then I take it to the track and slowly lean it out to gain performance.

Toe-out. Your first notion may be to run toe-in, but keep the front wheels as close to centered as possible, and maybe a little toe-out will help the car steer better under power.



• **Chassis.** The chassis is the ⅛-scale standard—sturdy, 3.25mm-thick T7075 aluminum. Its sides have a slight radius for increased rigidity, and its newest feature is that the engine has been moved farther back for better weight balance. The chassis has been clear anodized; instead of a flashy color, it has a natural silver finish.

On the chassis' flip side, all the screw holes are deeply countersunk to prevent them from being damaged, and the slots for the engine-mounting screw have a "step" to keep the screw well below the surface.

For added stability over bumpy sections, the Works has the same 10-degree front kick-up as the RR edition. Front and rear chassis braces help prevent the chassis from flexing; the front brace extends from the bulkhead to the center diff braces, and the rear is attached to the rear bulkhead and the main chassis.

The purple-anodized aluminum radio tray is supported by plastic standoffs and accommodates both servos and the radio box and keeps the receiver out of harm's way. The receiver battery pack is attached to the side and holds the mandatory flat 5-cell pack in place. Plastic splashguards that extend up and around the chassis' leading edge and under the bellcranks are attached to the chassis. This helps to keep out debris.

• **Drive train.** The center differential is supported by purple aluminum mounts and rides on rubber-shielded bearings. The diff housing is plastic and is mated to a steel main gear. Inside, cast-aluminum bevel gears suspended in a thick 7,000WT oil control power transfer to the front and rear diffs. These share their internal components with the center diff; the front also has a slight overdrive with a 40-tooth ring gear and a 12-tooth pinion gear. The rear uses a 38-tooth ring gear and an 11-tooth pinion. Up front, I used 3,000WT oil, and in the rear diff, I used 1,000WT (the lighter rear oil increases rear traction). The overdrives create a better on-power feel and allow higher corner-exiting speeds. The diffs may be reached for maintenance by removing the front half of the case. Small shims are used to adjust the ring-and-pinion gear's mesh, which I found very tight in the rear, no matter which shim position I tried. This is kind of disappointing for a car of this class and price. A short break-in session was required to free up the diff, and after a few tanks, the rear felt much smoother.

For improved traction and reliability, the XR Works includes universals in each corner and high-quality rubber sealed bearings; rubber seals are the best for keeping debris out of the bearings, and they're essential for the rigors of ⅛-scale off-road.

The diffs are a two-piece sealed design and are color-coded for the front and rear to avoid confusion.

Airtronics M8 radio and receiver
The M8 is Airtronics' flagship radio. With tons of easily accessible functions, the M8 was a perfect match for the XR. The digital trims and endpoint adjustment made servo setup a snap. The M8 is also one of the more comfortable designs; the steering wheel is in line with the trigger.

Airtronics 97358/94357 steering/throttle servos
A vehicle of this size and speed needs a set of servos that can take a beating. The 358's huge torque (200 oz.-in.) and transit speed (0.10 second/60 degrees) and the 357's 125 oz.-in. of torque and a 0.07-second transit time mean these servos are equipped to handle the most strenuous conditions.

OFNA/Picco .21 engine
OFNA's Picco-built .21 delivered consistent performance and seamless power. The larger 9mm carb hampered the low end slightly but made for better top speed. OFNA backs the engine with a 2-year warranty.

Mugen Seiki starter box
With twin 550-size motors, twin 6-cell pack holder and bearing-supported belt drive, the box cranked the engine over easily. The starting wheel can be positioned to start both left- and right-side motors.

Trinity Monster Horsepower 20-percent Team Blend fuel
Once broken in, the engine ran smoothly and consistently with the 20-percent-nitro fuel. The Team Blend provides a little extra punch but is more sensitive to needle adjustments. If you race, this fuel will deliver the power.

Mugen Powerpack 900mAh NiMH receiver pack
The flat 5-cell pack was a direct fit for the XR battery hold-down brace. The 900mAh offers plenty of power for those long A-main runs.

Above left: Worlds-winning Pro-Line Crime Fighter tires come in the kit and work well on most track surfaces. Left: the front suspension is very beefy and has large hubs that are included with the pivot ball. This is a good view of the silicone diaphragm that protects the shock shaft from the dirt.

Braking is supplied by dual steel disc brakes with fiber pads. The push/push system allows both front and rear brakes to be actuated in the same servo direction. Front-to-rear brake bias can be adjusted either by moving the retaining collar or by using the finger adjustments for fine settings.

• **Suspension and steering.** The front suspension is a double A-arm configuration with bulky pivot-ball hub carriers that ensure the suspension can take a beating; the pivot balls allow infinite adjustment of front track and camber. Both upper and lower arms are secured by beefy hinge pins. The upper link slides forward and backward to allow quick and easy caster changes with snap-in clips. The lower arm has up- and down-stops to limit suspension travel. On fast, smooth tracks, this is a key tuning aid to keep the chassis level.

The thick, 3.25mm aluminum shock tower matches the purple theme. The front tower has eight mounting positions and the lower arm has three positions to allow plenty of tuning options. A front swaybar is included as standard equipment.

The rear suspension uses a lower H-arm with an adjustable upper link. The rear arm is mounted on an aluminum mount with the same thick hinge pin as is used up front; and the pin is secured by a setscrew. The lower arm uses turnbuckles to attach the rear hub carrier; this allows toe-in adjustment. The XR comes with two different rear hub carriers; one has six camber-link locations and the other has three. The three-hole carrier also lowers the axle to make the car handle better on bumpy tracks.

The rear shock tower is 3.25mm thick and has eight shock-mounting positions and two camber-link locations for dialing in rear traction. The rear also gets a slightly thicker swaybar to control rear traction and keep the chassis level. For extremely rough tracks, the swaybar can be disconnected.

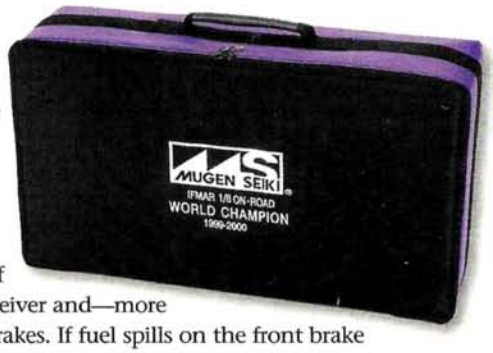
For ease of starting, Mugen offers the Pro Starter B11—a lightweight starting box. The wheel can be adjusted for right- and left-side engines. Its all-aluminum case and powerful 550 motors start the tightest of engines.

The front and rear shocks are sealed by double O-rings and have an air bladder in the cap to reduce emulsification. The rear shocks are slightly longer, but essentially, they are the same as the front shocks and were very easy to build.

Silver springs are included, as are 350WT oil and 1-hole pistons to damp the shocks. Preload spacers are used to obtain the proper ride height. The result is a smooth suspension with adequate ground clearance.

Steering is achieved by a bellcrank system that rides on metal-shielded bearings for precision and efficiency. A built-in, spring-actuated servo-saver protects the steering servo.

• **Engine and accessories.** I used an OFNA/Picco .21 to power the XR. This authentic Picco engine provides excellent power and reliability. I mated the engine with a Rex exhaust header and tuned pipe. The large air filter was included in the kit and protected the engine from dust. The fuel tank is mounted on two plastic stand-offs that are attached to the chassis. The spring-loaded cap has the pressure line built in. A handy splashguard is attached to the tank



A handy carrying case contains all the parts for the kit. When the kit is complete, it fits snugly in the case for easy transportation.

to reduce the chance of fuel getting into the receiver and—more important—the front brakes. If fuel spills on the front brake disc, the brake's effectiveness will be reduced until the oil has burned off. A plastic clip for an optional in-line fuel filter is included. To keep things tidy, fuel-tubing clips keep all the lines running in the same direction and not flopping all over the place.

• **Body, wheels and tires.** The Works comes with the same body as the previous edition, but the cutouts for the engine and fuel tank have been moved to accommodate the new engine location. Sweet-looking, white, 6-spoke wheels have Pro-Line Crime Fighter tires attached to them. Painting ace Greg Vogel used Parma Faskolor paints for the eye-catching finish.

PERFORMANCE

After a long break-in, I took the XR out and trimmed it out. The OFNA/Picco engine obviously had serious power and the XR was ready to handle it. Acceleration was awesome! The Pro-Line Crime Fighters hooked up and sent the big buggy barreling forward. With the changes in engine placement, the steering response was a little different from the previous RR version's. Turn-in was excellent for a class that is notorious for not having enough steering. The XR's strong point was carrying speed through and exiting the turns. It also felt very confident over the rough sections, and it gobbled up imperfections in the track.

Jumping was no problem, as the nose always seemed to be parallel with the ground, but when it did get out of shape, a quick blip of the throttle snapped it back to level.

Braking was also impressive: the dual disc brakes stop the XR quickly and brake bias is easy to adjust. I was able to dial the brakes to be just how I like them: heavy rear brake and minimum front. I found this setup to my liking because it allowed me to kick the rear out in tight turns and go around the track faster.

VERDICT

The Mugen MBX4 XR Works may be the best handling ⅛-scale buggy out there. Although it costs slightly more than some of its competitors, you get a loaded machine with all the factory options. When you're out in the 30-minute A-main, the quality of the XR will be apparent. If you want a top-of-the-line off-road machine, the XR gives you all the goodies you could want. Not only does it have style, but it also has the performance to go to with it ■

SOURCE GUIDE

AIRTRONICS
1185 Stanford Ct., Anaheim, CA 92805; (714) 978-1895; fax (714) 978-1540; www.airtronics.net.

MUGEN USA
20914 Blake Pky., Ste. 106, Lake Forest, CA 92630; (949) 707-5607; fax (949) 707-5614.

OFNA RACING
22692 Granite Way, Ste. B, Laguna Hills, CA 92653; (949) 586-2910; fax (949) 586-8812; www.ofna.com.

PARMA/PSE
13927 Progress Pky., North Royalton, OH 44133; (440) 237-8650; fax (440) 237-6333; parmapse.com.

REX
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TRACK TEST
1/6-SCALE NITRO

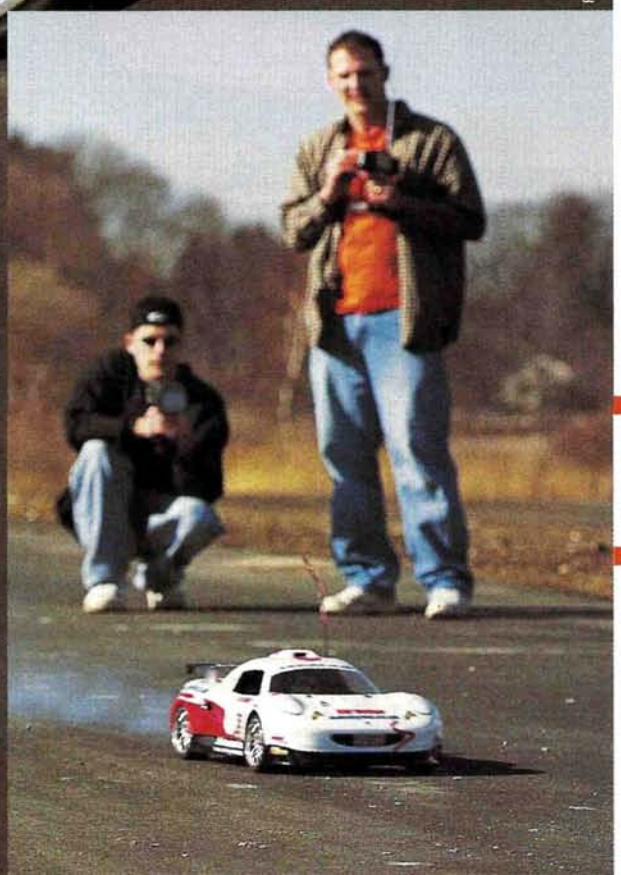
Schumacher Big 6 Nitro

What started as a joint effort between Schumacher and Group Lotus Ltd. has become literally one of the biggest things to hit the RC scene in a while. Schumacher's 1/6-scale Big 6 Lotus Sport Elise was originally designed exclusively for Group Lotus Ltd. as a novelty for its full-scale Lotus Elise owners. Because of the overwhelming response, however, Schumacher decided to make this unique RC vehicle available to the masses.

We reviewed the electric Big 6 Lotus Sport Elise in the December issue of *RC Car Action*, but now it's time for the lowdown on the highly anticipated nitro version. With a big-block .21 engine bolted to the factory-assembled chassis, I'll tell you right now that this "Track Test" is all about fun. Ready for some high-speed action? Then turn the page, but watch out because the G-Man has taken over the transmitter!

A big car that doesn't cost big dollars

by George M. Gonzalez



PHOTOS BY WALTER SIDAS

DATA CENTER

VEHICLE TYPE 1/6-scale on-road car

BEST BUYER Racers and enthusiasts of all skill levels and those who like it big

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Very good
Parts fit/finish Good
Durability Good
Overall performance Good

SPECIFICATIONS

MANUFACTURER Schumacher
MODEL Big 6 Nitro
SCALE 1/6
STREET PRICE $379.99
TOP SPEED 54.1mph

DIMENSIONS
Wheelbase 15.62 in. (396.77mm)
Width (F/R) 12.81 in. (325.37mm)/12.75 in. (323.85mm)

WEIGHT
Total, as tested 126.5 oz. (3,590g)

CHASSIS
Type Flat plate
Material Aluminum

DRIVE TRAIN
Type 2WD
Transmission Sealed 2-pulley, single-belt gearbox
Primary Clutch bell/spur gear
Drive shafts (F/R) Universal sliders
Differentials (F/R) Ball
Bearing type Shielded bearings

SUSPENSION (F/R)
Type Lower suspension arm w/fixed upper links
Damping Coil-over, oil-filled shocks

WHEELS
Type One-piece plastic

TIRES
Type Rubber slicks

ENGINE AND ACCESSORIES
Engine Thunder Tiger Pro .21R round port, rear exhaust
Starter Recoil pull-start
Carburetor Slide with 9mm venturi
Exhaust Aluminum tuned pipe and cast-aluminum header
Fuel capacity 150cc

LIKES

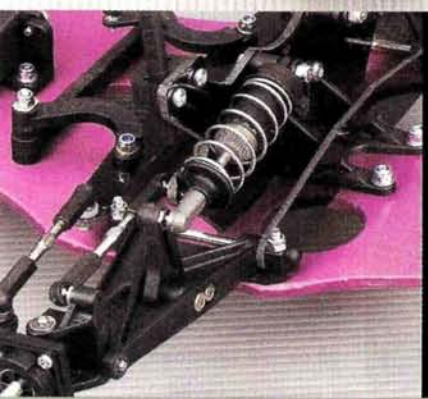
- It's big and fast.
- Fun to drive.
- Great engine.
- 90 percent assembled.

DISLIKES

- Substandard steering linkage and servo-saver.
- No front bumper included.
- No foam inserts included for the tires.

Everything is nicely arranged on the radio plate. Twin 75cc fuel tanks provide long run times and look cool mounted on the chassis. I installed a GS Racing heavy-duty servo horn on the Hitec HS954MG high-torque servo and replaced the kit's flimsy Z-bend wire linkage with a turnbuckle, pivot balls and rod ends.

Here's Kevin Hetmanski providing a sense of scale for the Big 6. Even compared to a lug like Kev, the Big 6 looks huge! For a guy who is afraid of spiders, Kev looks pretty tough in this shot.



Left: check out the tall, molded shock mounts that raise the bottom of the shocks and the S1-composite shock tower and hinge-pin brace—trick stuff. I replaced the stock fixed links with adjustable Lunsford turnbuckles. Right: the rear shocks are mounted on a two-piece S1-composite shock tower. Heavy-duty universal sliders transfer the power to the wheels. Note the 180-degree header.

building & setup tips

The moment you open the box, you're greeted by the huge Lotus Sport Elise body, but a factory-assembled rolling chassis soon comes into focus underneath the clear body shell. Just then you realize that you'll have fun sooner than you thought! A few tasks, such as building the fuel tanks and installing your radio gear, still need to be taken care of before you can yank on the engine's pull-start rope. Schumacher provides an excellent finishing and maintenance manual, but here are a few additional tips.

Page 3, step 3. Slightly moisten the rubber O-ring before you join the tank halves. This will ensure an airtight seal. Install the yellow-foam fuel filter in one tank only.

Page 7, step 3. If your servo doesn't have enough torque to quickly open and close the slide carb, you'll need to remove the throttle return spring. A high-torque servo with at least 50 oz.-in. of torque is required to operate the throttle with the return spring attached, but this is definitely the better way to go.

Page 10, step 3. You can install the fiberglass exhaust support bracket on the body as instructed in the manual, however, I chose not to because I didn't want to make any more holes in the body.

Page 11, step 2. Lube the two-stage air-filter elements with air-filter or after-run oil before you turn the engine over. Clean the foam elements often to ensure maximum performance. You can use warm soapy water, but be sure they are completely dry before you reapply lubricant and reinstall them in the air-filter base.

Shock prep. Check the shocks to be sure they are properly filled with oil. Our car needed a few drops of oil in each shock before they operated smoothly and silently.

YOU'LL NEED ■ Transmitter and receiver ■ Steering and throttle servos ■ Receiver pack ■ Glow igniter ■ Fuel ■ Fuel bottle ■ Polycarbonate-compatible paint ■ Tire glue ■ Air-filter oil

FACTORY OPTIONS ■ Alloy engine mount—part no. G554C ■ Turnbuckle set—U2361C ■ Front foam bumper—U2357X ■ Purple-alloy short shocks w/tuned spring set (pair)—U1559U ■ Rear anti-roll bar—U2362D ■ Purple-alloy pivot blocks—U2365G ■ Slick racing tires with foam inserts—U6689N ■ Twin 6-spoke wheels (chrome and white)—U2351P; U2350N

KIT FEATURES

• **Chassis.** The Nitro Lotus features the same 4mm-thick-aluminum chassis as the Electric Lotus. The purple-anodizing looks great, but our test vehicle's chassis had many rough edges that could not be filed smooth without removing the anodizing. (Come to think of it, removing the anodizing on the chassis' edges would look pretty trick.) The long and wide chassis is fully countersunk and kicked up to provide approximately 10 degrees of front rake. Although fairly rigid, it allows some side-by-side and fore-and-aft flex, and that concerns me because the car does not include a front bumper and leaves the body to protect the chassis and the front suspension. Fortunately, Schumacher offers an optional foam front bumper—at the top of my must-have list. A radio plate made from Schumacher's S1 fiber composite is mounted on short plastic posts to elevate it slightly above the chassis. The radio plate neatly houses the radio gear and both fuel tanks (yes, the Nitro Big 6 has two fuel tanks).

A twin-bellcrank steering system with an S1-composite drag link pivots smoothly on aluminum posts. Unfortunately, the flimsy piano-wire steering linkage is easily tweaked in a crash, and the spring-loaded servo-saver doesn't have enough spring tension to guide this 7-pound-plus vehicle with precision. I immediately replaced the steering linkage with a 39mm tie rod and molded ball cups and installed a GS Racing heavy-duty servo-saver in place of the stock one. With this setup, any standard servo will be able to control the Nitro Lotus, but I felt that an impressive car like this deserves high-end electronics (see "Test Gear" sidebar).

• **Suspension and steering.** The Nitro Lotus has the same lower-arm, upper-link suspension system as on the Electric Lotus. The suspension uses parts from Schumacher's 1/10-scale Nitro 21 XT-R truck. Molded, fixed upper links and steering arms ensure that the wheels are properly aligned, but they do not allow camber or front toe-angle adjustment. Fixed links are not only convenient but are also necessary for first-time racers who may not have the alignment tools to properly set up an RC vehicle. I replaced the fixed links with a complete set of Lunsford titanium turnbuckles, so I could tinker with the suspension. Schumacher offers a complete turnbuckle set that includes everything you need in one convenient package.

Schumacher's excellent plastic-body, oil-filled shocks with adjustable two-piece shock pistons and volume-compensating foam pads are mounted almost parallel on the chassis. The shocks' upper portions are mounted on front and rear S1-composite shock towers, while the lower portions are attached to tall molded shock extensions that are mounted on the suspension arms. The shock extensions raise the shocks so that they are almost parallel to the chassis. This laydown shock-mounting position provides stiffer and more linear damping and works very well. Stiff silver springs and clip-on spring preload spacers in various sizes to adjust ride height are provided. The shocks on our test vehicle were a bit squeaky, but each shock only required a few extra drops of shock fluid to provide smooth and silent performance.

• **Drive train.** The massive power from the 3.5cc glow engine is transferred to the rear wheels through a 2-pulley, belt-drive sealed gearbox that's essentially the same unit as found on the Nitro 21 XT-R monster truck. This simple and efficient tranny features a single reinforced belt that drives a heavy-duty ball-diff pulley with giant 3mm diff balls and an aluminum-alloy top gear pulley that's pinned to a steel layshaft. A 61-tooth, 32-pitch spur gear is installed on the layshaft outside the gearbox, and a fiberglass disc brake with aluminum brake pads is also installed on the layshaft between the gearbox and spur gear. Heavy-duty universal sliders provide the final drive, and the entire drive train (and wheels) spin on shielded ball bearings.

• **Engine and accessories.** The included Thunder Tiger Racing Pro .21R round rear-exhaust engine comes installed on the chassis awaiting radio installation to bring it to life. It features a large purple-anodized heat-sink head, an aluminum piston with chromed-brass sleeve, a slide carburetor with 9mm venturi and a rugged recoil pull-start mechanism. An aluminum flywheel, a 19-tooth, 32-pitch clutch bell equipped with ball bearings and a 2-shoe clutch are also installed.

The transverse-mounted engine has a 180-degree cast header that routes the tuned pipe behind the engine. A long, prebent rubber exhaust tube is connected to the tuned pipe's stinger and routed through the rear shock tower and out the chassis' back. The engine is installed on a molded engine mount that doesn't dissipate heat very well, but Schumacher offers an optional aluminum-alloy engine mount that turns the chassis into a giant heat sink.

All the necessary throttle and brake linkages, return springs and collars are included to complete the radio system installation. A heavy-duty throttle return spring that's mounted on the rear shock tower and to the throttle arm actually pushes the slide carb back to neutral in the event of a signal loss. I initially installed a standard servo to operate the throttle and brake linkages, but it barely had enough torque to open up the throttle completely because of the resistance caused by the throttle return spring. I decided to install a high-torque servo, and it had no problems coping with the return spring.

The Nitro Lotus features twin, 75cc fuel tanks that must be assembled and installed on the radio plate. I like that the tanks are rebuildable because you can take them apart for a thorough cleaning. The tandem tanks' design appears to balance the weight of the fuel evenly across the chassis, like on many full-scale racecars, but this is actually not the case. If you install the fuel line according to the instructions, the right (inside) tank will draw fuel up from the left (outside) tank, which is pressurized by the tuned pipe. This means that the left fuel tank will

Hitec Lynx FM radio system

I used an affordable Hitec Lynx FM radio system to control the Nitro Lotus. A Hitec DCX dual-conversion receiver

catches the signals. The radio operated glitch-free during the testing, and I enjoyed the radio's extra-long signal range.

Hitec HS925MG and HS945MG coreless servos

I decided to keep it all in the family by installing a pair of Hitec coreless servos. An HS925MG high-speed/high-torque servo whips the wheels from lock to lock in a microsecond and has excellent holding power. The servo may seem like overkill for a throttle-and-brake application, but a powerful servo is needed to operate the throttle linkage because of the high-tension return spring. The 945 has no problems opening and closing the throttle, and it puts quite a yank on the disc brake arm.

Traxxas Top 20-percent nitro fuel

The Thunder Tiger engine seemed to like this stuff because it put out enough power to practically throw the tires off the rims.

GS Racing Stuff

The Nitro Lotus is a cool car, so I wanted to give the chassis some more pizzazz. GS Racing offers all sorts of colored nitro accessories to dress up any chassis. I chose the heavy-duty servo horn and servo-saver (both purple) and purple silicone fuel line and exhaust coupler.

continuously feed fuel to the right fuel tank until the left tank is completely empty; this defeats the purpose of having twin fuel tanks balanced across the chassis. It is possible to rig up the fuel line to provide a balanced fuel delivery system, but this involves pressurizing both tanks simultaneously and rigging up a 3-way fuel-pickup system that joins the fuel line from each fuel tank and sends a single line to the carburetor pickup. In either case, the twin fuel tanks provide more fuel-holding capacity than a single 125cc tank, and that means longer run times—and more fun.

• **Body, wheels and tires.** The huge ⅛-scale Lotus Sport Elise body is the car's biggest feature (no pun intended). The clear body is molded from super-thick Lexan for extra strength, and it includes window masks and decals for easy painting and detailing. The body for this Track Test features custom decals and graphics, but with a little imagination, you can come up with your own interesting paint scheme. Stylish, black-nylon 12-spoke wheels are included, as are low-profile rubber slick tires. The wheels are the same diameter as common ⅛-scale buggy wheels, which means that many tires designed for off-road buggies will fit the Nitro Lotus. Unfortunately, the tires are not equipped with foam inserts. For better performance, Schumacher does offer optional racing tires molded from a softer, stickier compound with included foam inserts. Chrome and natural white replacement wheels are also available (we equipped our car with chrome wheels for the photo shoot).

PERFORMANCE

The engine fired up faithfully after a couple of tugs on the pull-start rope and ran amazingly smoothly considering the too rich carb setting. I started to gradually lean out the high-speed needle, and by tank number four, the Nitro Lotus was showing its true colors.

The Nitro Lotus surprised me with its quick acceleration. Schumacher's engineers claim that the car can accelerate from zero to 40mph in 1.9 seconds, and after driving this car, I think their speed claims are accurate. During the photo shoot, assistant editors Greg Vogel and Derek Buono radar-tested the car and clicked off a 54.1mph run. The vehicle is very fast and stable, but getting it to turn sharply requires some creative throttle and brake control. Even at slow speeds, the car has a very wide turning radius, but letting off the gas and applying the brakes swings the car's rear end around, which helps it negotiate tight corners. I ended up setting the throttle/brake linkage with a slight drag brake, and that helped a lot. I soon had the car dialed and was able to toss it around like a much smaller vehicle.

The twin fuel tanks provide long run times, but the engine's air/fuel mixture seemed to lean out as the fuel was drained from the tanks. The left tank would drain completely without any problems, but the engine would start to run a little hot by the time the right tank got to the halfway mark. I remedied this by setting the high-speed needle a little on the rich side initially and by making more frequent fuel stops. Other than this small problem, the Nitro Lotus ran great and was a blast to drive. I also appreciated that the car seemed unaffected by the imperfections on the street surface. The Nitro Lotus ran over dips, sewer caps and cracks in the road without losing its composure.

THE VERDICT

The Nitro Lotus is big, fast and fun. And with a street price of less than $380, it's a downright bargain! Never has large-scale RC been so easy and affordable to get into. Racing classes for the Big 6 Nitro and Electric Lotus have already been organized in Europe, and the British Radio Control Association (BRCA) has embraced the classes as well. Check out Schumacher's website (www.racing-cars.com) for details on the Big 6 racing class. I think that Schumacher has hit a home run with the Big 6 Nitro Sport Elise, and I feel racers and enthusiasts will really appreciate the benefits that this large-scale vehicle offers. ■

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Behind the scenes at

Associated's "Guinness Book" speed record attempt

BY GEORGE M. GONZALEZ

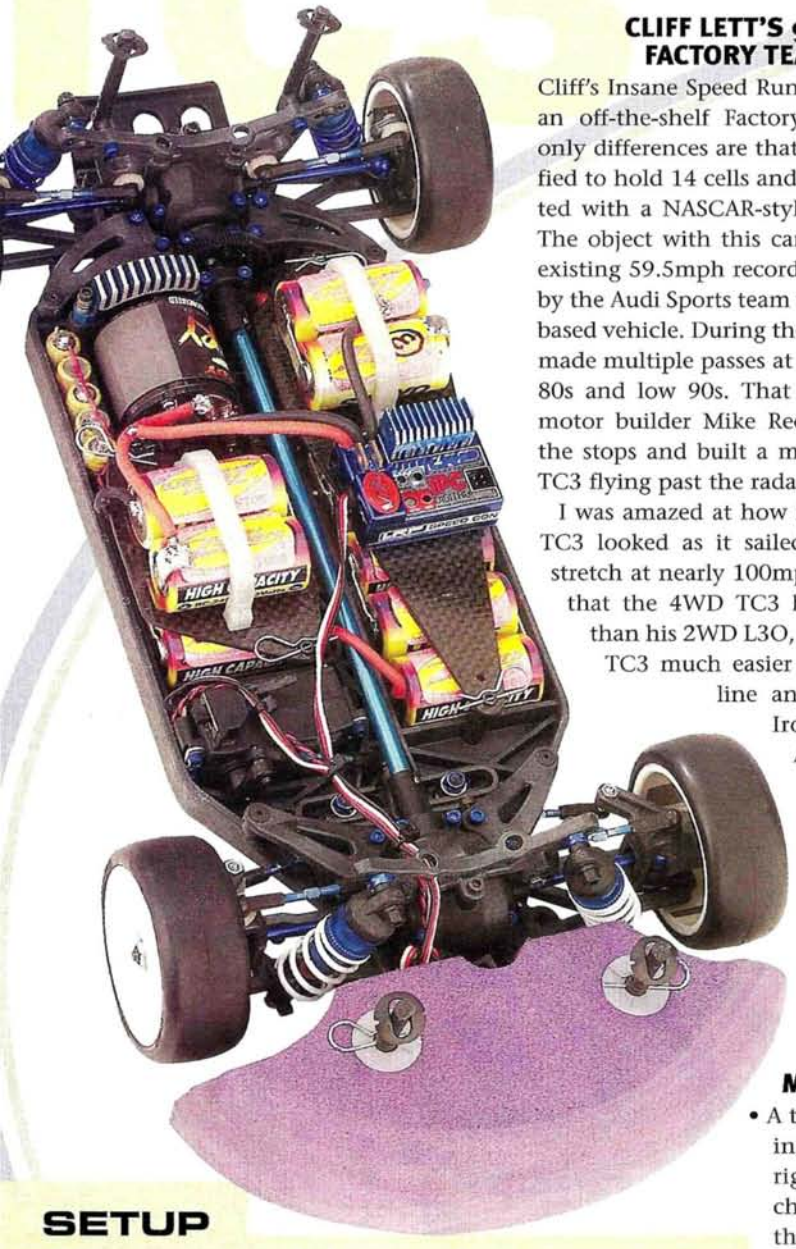
The "Guinness Book of World Records" credits Finland's Audi Sports with the official RC car world speed record of 59.09mph (95.1kph). Although some may consider 59mph to be a respectable record, just about any RC vehicle that's powered by a 3.5cc nitro engine could challenge the world record without even leaning out the engine's high-speed needle valve! Our sister publication, *Radio Control Nitro*, featured Steve Pond's 101mph HPI Super Nitro RS4 (see the March 2001 issue). Prior to that, Cliff Lett's 24-cell Associated L30 Insane Speed Run car was clocked at 94mph at the Dominguez Hills Bicycle Velodrome in California. And let's not forget IEDA Champion, Chris Collins; his 18-cell Top fuel dragster was clocked at 112.7mph at Northstar Dragway in Minnesota. These top speed achievements, however, were never staged for the officials from the "Guinness Book of World Records," which is why the Audi Sports record has remained intact—until now. Thanks to the efforts of the R&D crew at Team Associated, Dan Moynihan from Dan's Promotions and Doug Stokes, who is the director of communications at Irwindale Speedway in Irwindale, CA, a formal speed challenge was held on January 13, 2001 to break Guinness's published record and post a speed more befitting of an official world record title. The result? Legendary RC racer and Team Associated chief designer Cliff Lett spooled up his Factory Team TC3 to over 95mph and touched 111mph with an RC10 L30! How did he do it? To answer that question, we have an exclusive, inside look at Cliff's record-breaking machines.

THE NEED

FOR SPEED

Above: no, this is not a real car! It's The A-Team's TC3 Insane Speed Run Sedan. Don't let the Dodge grill fool you; the body is actually a Protoform Chevy Monte Carlo superspeedway body.

Cliff's L30 Insane Speed Run Car sits on the track waiting for the all-systems-go signal.



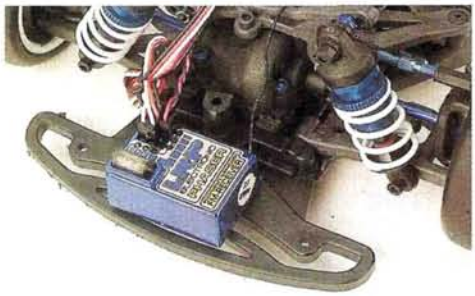
CLIFF LETT'S 96.4MPH FACTORY TEAM TC3

Cliff's Insane Speed Run Sedan is basically an off-the-shelf Factory Team TC3. The only differences are that it has been modified to hold 14 cells and it has been outfitted with a NASCAR-style body and wing. The object with this car was to break the existing 59.5mph record that had been set by the Audi Sports team with a production-based vehicle. During the event, Cliff's TC3 made multiple passes at speeds in the high 80s and low 90s. That was until veteran motor builder Mike Reedy pulled out all the stops and built a motor that sent the TC3 flying past the radar gun at 96.4mph!

I was amazed at how fast and stable the TC3 looked as it sailed down the backstretch at nearly 100mph. Cliff explained that the 4WD TC3 had more traction than his 2WD L3O, and that made the TC3 much easier to launch off the line and easier to drive. Ironically, Team Associated tested a 2WD TC3 speed-run car, but there wasn't any noticeable speed advantage even with the savings in rotating weight.

MODIFICATIONS

- A total of 5 cells were installed on the right side of the chassis in front of the motor; to accommodate the cells, three extra battery slots were milled out on the chassis' right side where the receiver and ESC are normally installed.
- To allow room on the chassis for another cell, A Futaba S9102 servo was used because of its unusually short case configuration.
- A graphite battery strap/plate was fabricated to secure the 3 additional cells in the new location and to make room for 2 more cells on top. A hand-machined plastic battery strap secures the 2 cells on top of the graphite battery strap/brace.
- On the chassis' left side, all seven slots are filled with batteries, and another graphite battery strap/plate houses two more cells on top. The LRP 7.1 ESC is also mounted on the battery strap/plate.
- A heavier, more rigid IRS-aluminum center shaft helps to reduce the side-load flexing that's caused by the incredible rpm of the inline-mounted motor.
- A Saiko Racing machined motor can with super-strong neodymium magnets and a Reedy 10-turn double armature produce the rpm needed to propel the TC3 to near-buck speeds.
- The receiver is neatly housed under the giant, custom-made foam bumper. Not only does the large bumper provide crash protection, but it also supports the front of the Protoform high-speed Monte Carlo body.
- A large buggy wing was installed on the rear of the body to provide more down-force and stability. As a final aerodynamic mod, the rear bumper was bent down to help reduce wind resistance.



With the front bumper removed, the LRP Phazer receiver is revealed. Cliff wanted to keep the receiver as far from the motor and batteries as possible.

The LRP V7.1 ESC has been outfitted with 12 gauge wires, but is otherwise unmodified. Note the receiver pack alongside the motor; every inch of this TC3 is filled with batteries!

SETUP

FRONT	REAR	
Suspension		
Shocks		
–oil	50WT	50WT
–piston	no. 3	no. 2
–springs	Associated White 40 lb.	Associated Purple 30 lb.
–upper shock position	Middle hole on tower	Middle hole on tower
Camber-rod positions	Lower inside	Lower inside
Camber	1.5°	2°
Caster	6°	–
Toe-in	0	1°*
Swaybar	None	None
Drive train		
–pinion/spur 44/88		
–final drive ratio 4.5:1		
Tires and wheels		
–Yokomo G belted slick tires		
–Shimuzu hard molded inserts		
–Pro-Line Inch Up Velocity wheels (24mm)		
Weight 72.5 oz. (2,060g)		

*Cliff installed a front arm mount backward–in place of the rear arm mount–to take away toe-in.

RACE GEAR

· **Transmitter** Airtronics Caliber 3PS · **Receiver** LRP Phazer · **ESC** LRP V7.1 · **Batteries** Reedy Zappers 2400mAh (14 cells) · **Motor** Saiko Racing machined motor can with neo magnets and Reedy 12-turn double armature, brushes and endbell · **Servo** Futaba S9102

CLIFF LETT'S 111MPH L3O

Cliff's Insane Speed Run car is a heavily modified Associated L3O that's outfitted with 24 cells and a specially fabricated chassis and body. If the car looks familiar to you, it's because it has been featured in *RC Car Action* a few times in various forms. This car has raced dozens of times at speeds approaching 100mph. It's amazing that the car—and body—have held up so well over the years. Then again, Cliff is an expert driver.

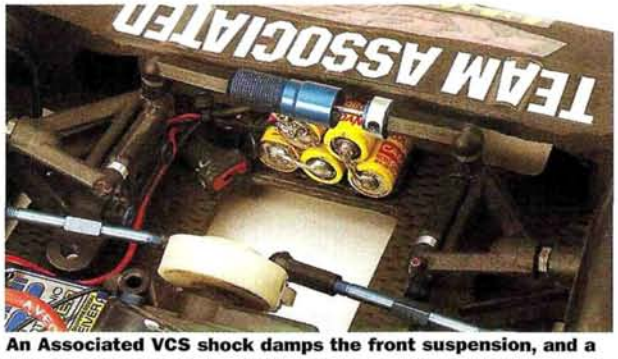
Team Associated's objectives with this car were to break through the 100mph barrier and to possibly set a new overall RC world speed record. As expected, the Team met its objectives by putting in back-to-back 100mph-plus runs. It wasn't until the car blazed past the radar at 111mph and wiped out on the large, banked corner that they decided to call it a day. After the run, Cliff reported that the motor still had plenty of revs left and could have gone even faster if space had allowed.

MODIFICATIONS

Cliff's L3O features a custom-fabricated, graphite chassis that's designed to accommodate 24 cells.

- Lexan side plates were installed on the chassis and hook-and-loop fastener secures them to the body's side panels.
- A graphite bar installed on the rear pod with molded ball cups (mounted standing up) prevents the body from rubbing against the rear tires at high speeds.
- The body is a narrowed Protoform Nissan P35 that was modified for superior aerodynamics. The entire molded-in driver cockpit was removed and a Lexan plate was installed in its place. A small plastic cockpit, actually from a small, static model airplane, was added to give the car some realism; otherwise, the body would be nothing more than a wedge.
- The body was reinforced with Lexan strips in all the crucial places, and Teflon tape was stuck on the body above the tires to prevent friction in case the tires rubbed against the body. The body's rear portion was completely opened up to allow air to pass through the chassis more efficiently, and enlarged side wings provide better high-speed stability.
- A large buggy wing helps increase rear downforce and adds stability on the straights.

That's a 2-turn Aveox brushless motor stuffed into the motor pod. Check out the super-high gearing. The graphite bar with the ball cups mounted standing up simply prevents the rear of the body from contacting the wheels.



An Associated VCS shock damps the front suspension, and a custom receiver pack is tucked under the bumper. The pack is good for about 5 minutes.

RACE GEAR

· Transmitter Airtronics Caliber 3PS · Receiver LRP Phazer · ESC Aveox F5HV · Batteries 1000mAh 2/3 sub-C batteries (24 cells) · Motor Aveox 1409/2Y 2-turn brushless motor · Servo Airtronics 94151

SETUP

	FRONT	RIGHT SIDE	LEFT SIDE	CENTER
Shocks				
–oil	30WT	25WT	25WT	40WT
–piston	–	–	–	no. 3
–springs	Red 0.22 in.	Gold 12 lb.	Gold 12 lb.	Red 22 lb.

	FRONT	REAR
Camber	1°	–
Caster	12°	–
Toe-in	0	–
Jaco Caps tires	Green	Yellow

Drive train

–pinion/spur 28/69

–final drive ratio 2.46:1

Weight 74 oz. (2,100g)

Mike Reedy and Cliff Lett examine an armature that blew up during an 86mph run.

Team Associated (left to right): Rodger Curtis, Torrance DeGuzman, Duane Silva, Mike Reedy, Cliff Lett, Curtis Husting, Mike Ogle and team driver Tony Phalen.

FINAL THOUGHTS

As you know, this event was organized to break the existing "Guinness Book" RC world speed record and to post a speed that is a true reflection of what a modern RC car can do. The main goal, however, was to promote the hobby on network television. The staff at Team Associated would like to acknowledge that, even though they were the first to take the necessary steps to formally challenge the existing RC world speed record, Chris Collins' posted 112.7mph speed is *still* the benchmark. Meanwhile, the A-Team is preparing for another record attempt; they want to push the TC3 past the 100mph barrier and the L3O past a buck and a quarter. You can bet that we'll be there to cover the next attempt, and they hope that other RC manufacturers will want to join in on the action! ■

40, 60, 85, 96mph—this TC3 is gone! Look at the how the rear wing is pushed down by the massive airflow.

Cliff Lett balances a tire while Duane Silva works on Cliff's L30 chassis. Mike Reedy supervises in the background.

That's Cliff Lett on the three-story camera tower. This position made the most sense for driving, but the climb up was pretty hairy.

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FUTABA
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BUT IS IT OFFICIAL?

There are a two ways to establish a new RC world speed record. The first is to have a representative from the publishers of the "Guinness Book" in England witness the record-breaking event. The second possibility is to have the event aired on the U.S.-based "Guinness Book of World Records" TV show, which is actually a separate entity from the printed media production. Being aired on the TV show, however, is a shoo-in for having the world record published in the book. As you can imagine, it isn't easy to persuade someone from the "Guinness Book" to travel all the way from England to witness an RC car speed-record attempt. Master RC promoter Dan Moynihan, however, managed to spark the interest of the producers of the TV show and was able to set a date to videotape the record-breaking attempt and, if successful, air it on the popular weekly television program.

Unfortunately, the film crew had to cancel at the last minute and wasn't able to tape the speed-record attempt at Irwindale Speedway. This didn't stop the event from taking place, though; instead, the ABC News Team videotaped it, and the speeds were recorded with a super-accurate Stalker police radar system (similar to the unit we use here at *Radio Control Car Action*). The event was aired on network television in several time slots, including prime time, which meant that millions of people saw it. The videotape and radar data have also been sent to the producers of the "Guinness Book" TV show. At the present time, however, Cliff Lett's record-breaking 111mph run still has to be verified, and the existing 59.5mph record still stands. Let's hope that the videotape and all the exposure will entice them to publish this new speed record soon. Who knows? Maybe we'll even see Cliff Lett set an even faster RC speed record on TV.

MICRO RC

BY BOB HASTINGS

Micro cars (which we define as anything smaller than 1/12 scale) have seen a recent surge in popularity since the release of Kyosho's 1/28-scale Mini-Z series, but micro cars have a long history in RC. Tamiya's beautiful TamTech models were highlights, and they incorporated the scale detail for which the modeling giant is known. Kyosho also experimented with micro cars long before coming up with the Mini-Z and even offered the Ultima buggy In 1/24 scale with a functional diff and long-travel (relatively speaking!) independent suspension. BRP's line of simple, inexpensive micros has been well received for years; and for those modelers who race on indoor tracks that are cramped even by 1/12-scale standards, the BRP cars offer a great way to go racing. We figured it was time to take a look at everything available in the sub-1/12-scale category. Everything you need to know for big fun with little cars is here!

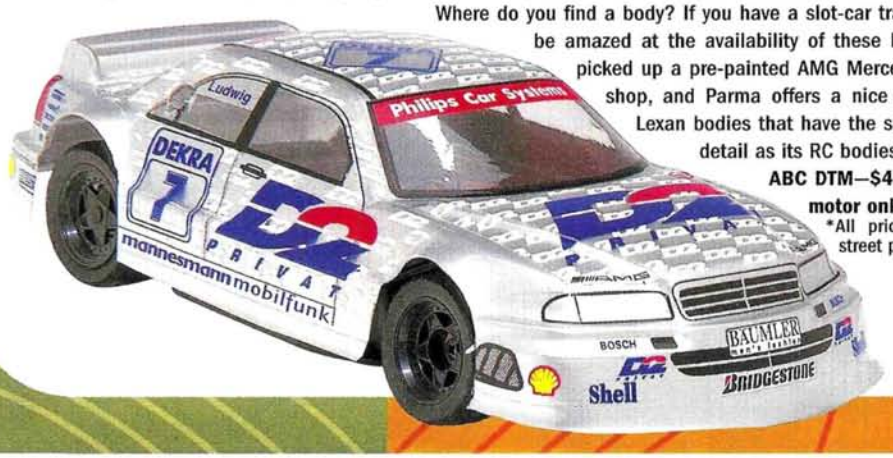
ABC DTM

The Driver Training Model (DTM) is a 2WD 1/24 scale that's imported by Ultimate Hobbies of California. Originally available as a full kit with body and electronics, only the chassis/motor kits are currently available. ABC is preparing to release a follow-up to this DTM that is rumored to have 4WD available.

The kit goes together in a single evening; the chassis consists of a long flat plate with a separate, rear motor pod and steering plate. There are three mounting positions for the front steering plate and two for the rear pod. This means you'll be able to adjust the car's wheelbase from 100 to 115mm for a variety of bodies.

The flat plate and rear-mounted drive train give it the look of a miniature pan car. The steering servo is taped to the front steering plate, and a threaded shaft runs via ball cups from the servo's output arm to the right front steering block. A similar shaft from the bottom connects the two steering blocks. As far as suspension goes, the rear end simply flexes at the point where it's attached to the chassis, while the front wheels are individually suspended by a spring above the steering block. The DTM features a Mabuchi FK-130 motor (mounted in an adjustable plate) driving a relatively large ball differential. The axles are supported by bronze bushings, and the DTM has foam tires for optimum traction. The tires are taped onto the rims, so when it's time to re-tire, you just tear off the tape instead of having to buy rims, too.

Where do you find a body? If you have a slot-car track nearby you'll be amazed at the availability of these little creatures. I picked up a pre-painted AMG Mercedes at our local shop, and Parma offers a nice selection of 1/24 Lexan bodies that have the same attention to detail as its RC bodies.



ABC DTM—$40* (chassis and motor only)

*All prices are estimated street prices.

BRP INC. FUN WON AND SUPER OVAL OUTLAW

At 1/18 scale, Bud's Racing Products (BRP) cars are larger than the rest of the group, but that extra room makes a big difference if you dread dealing with really small parts. The car kit can be equipped with components of standard size, and—best of all, for race fanatics—they'll carry standard RC transponders. If your local track is outdoors only, these cars may be a viable indoor alternative for racing.

BRP has created cars in two platforms: the Fun Won and the Super Oval Outlaw. Both feature the same tub-type chassis with molded-plastic sides, but the Fun Won has a wider track and larger wheels and tires. Both have fiberglass front arms; the front suspension consists of springs above the steering block that allow independent block travel up the kingpin. The kingpin is bolted to the front arms with a nut on either side. A solid axle protrudes from the steering block. The front wheels have a brass bushing, slide onto the shaft and are held by a locknut.

A single piece of music wire connects the steering blocks as a toe link, and a pair of wires connected by a wheel collar run from the right block over to a rear-facing steering servo. If you plan to install a standard-size steering servo, such as the Hobbico CS-51 I used, you'll have to remove the mounting ears so that the servo will fit between the chassis' sides.

In the back of the chassis is the motor pod; it's made of fiberglass on one side and has a metal heat-sink plate on the other. The entire unit is hinged on the bottom and has a single trailing-arm suspension on top. A standard solid rear axle passes through brass bushings on either side of the pod, and the hubs are held on the shaft with setscrews. The car is equipped with mounted and trued foam tires and wheels that are attached to the hubs with a machine screw.

I like the scale appeal of the NASCAR-influenced bodies, and there are shells available to satisfy Ford, Chevy and Dodge fans. BRP also offers Super Truck and touring-car bodies that fit the chassis. For the Fun Wons, the bodies include stock, touring, racing truck, a bunch of Euro supers and Da Bug, which is based on the current VW.

BRP Fun Won—$99 (minus electronics)

BRP Oval Outlaw—$79 (minus electronics)

CAR GUIDE

LITTLE CARS, BIG FUN

DRIVING REPORT

My first lesson in how quick the DTM is came when I set up the radio. As I advanced the throttle trim, the little car suddenly rocketed across my desk, and I barely caught it before it fell off. The power is just amazing for this size of vehicle, and it's clear why ABC calls this a "Pocket Racer." Bar none, the DTM accelerates faster than any other car in this guide. If your radio has an exponential function, it will come in handy because the car, using 6 cells, responds extremely quickly.

When the next generation of the DTM arrives (and that should be soon), look for a host of scale-looking bodies that fit this chassis, too. The list includes Testarossa, AMG Mercedes, Nissan Gr. C, Alfa 155DTM, Jaguar XJR-9, Opel DTM, Porsche 962C, Subaru WRX, Porsche 959, Volvo 850, VW Beetle, Acura NSX, RX-7, Supra GT, Skyline, 560SCE, Diablo, Honda Del Sol, Toyota MR2, Porsche 911, Nissan Skyline and 1/20-scale Mini Cooper. Should you wait? That's up to you, but while the current DTM chassis is still available and dirt cheap, I'd grab one.

QUICK SPECS

SCALE 1/24
WHEELBASE 100 to 115mm
TOP SPEED 10.6mph

YOU'LL NEED

- **1/24-scale body**
- **Speed control (mini ESC preferred)**
- **2-channel radio**
- **Small 4- to 6-cell battery**

LIKES

- Pan-car simplicity.
- Adjustable wheelbase.
- Ballistic acceleration.

DISLIKES

- Short duration.
- Difficult to drive on anything except smooth carpet.

DRIVING REPORT

The BRP cars are immediately appealing because of their size; they aren't so small that you worry about breaking them, but they aren't too large to run inside. Off the line, the slot car's motor struggles a little to get moving, but after a few seconds, it has more than enough speed. The car rides a little stiffly, but it's pretty responsive to control input. The Oval Outlaws' steering can feel a little twitchy when going at speed, but the Fun Won's wider track eliminates this tendency. I did notice, however, that during hard cornering, if I accelerated too soon, the car swapped ends almost immediately. With the optional ball diff, the car tracked very easily around even the tightest bends. You can buy 4-, 5-, or 6-cell packs from BRP; not only does the 6-cell enhance performance, but it also offers longer run time.

LIKES

- Simple design.
- Good performance with components of standard size.
- Can carry race transponder.

DISLIKES

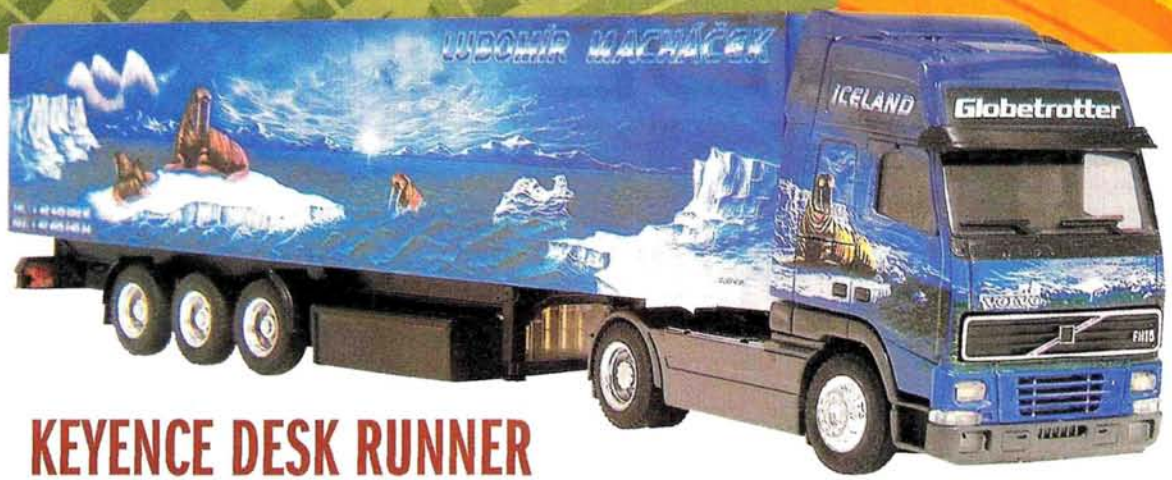
- Sluggish acceleration.
- Spins during hard cornering unless equipped with optional ball diff.

QUICK SPECS

SCALE 1/18
WHEELBASE 147mm
TOP SPEED 19.1mph (Fun Won); 12.6mph (Oval Outlaw)

YOU'll NEED

- **2-channel radio**
- **Polycarbonate-compatible paint**
- **Speed control**
- **4- to 6-cell AA battery pack**



QUICK SPECS
SCALE 1/87
WHEELBASE 141mm
TOP SPEED 2.5mph

YOU'LL NEED
- **Money.**
- **Clean, dust-free area to drive.**

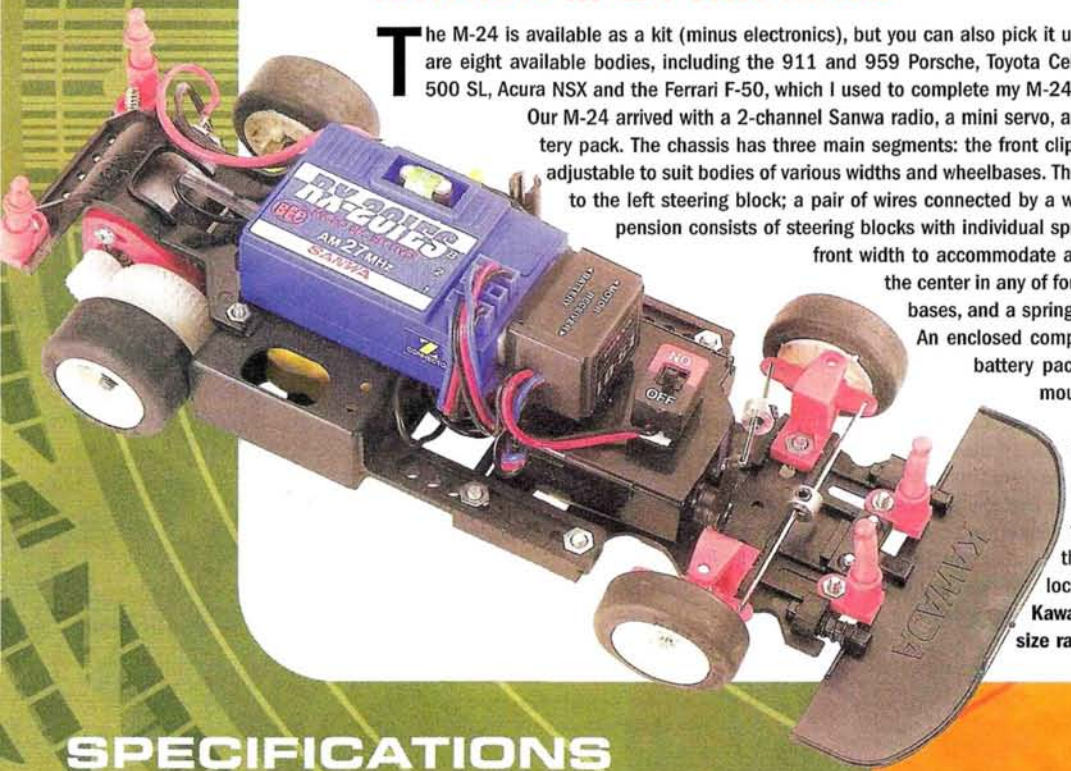
KEYENCE DESK RUNNER

This tractor trailer reaches our micro guide's limits, in terms of scale; the Desk Runner is the smallest of the bunch. Don't let its size deceive you, though; it's the most technologically sophisticated of the group. The 1/87-scale "big rig" has a 12-function controller that looks more like a VCR remote than an RC transmitter. But, as you might expect, the Desk Runner hauls the biggest price tag, too—a click over $500. The trailer houses rechargeable Ni-Cds and is permanently attached to the cab. Inside the front is a pair of servo motors—one for driving and the other for the steering. The circuit boards and the rest of the radio gear take up the rest of the cab's interior (all nicely concealed beneath a scale interior). Rather than using a conventional motor/servo layout, Keyence opted for this arrangement to conserve space.

No assembly is involved; simply charge up the truck on its display stand. While it's being charged, you're rewarded with a demo of the incredible lighting—high and low beams, turn signals, brake lamps, taillights and hazard lights. When the LED charge indicator goes out, it's time to play; ten-four.

Keyence Desk Runner—$500

KAWADA M-24 TRIPMATE



The M-24 is available as a kit (minus electronics), but you can also pick it up with everything that you need to get it going. There are eight available bodies, including the 911 and 959 Porsche, Toyota Celica GT-4 and Supra, Alfa Romeo 2000GT, Mercedes 500 SL, Acura NSX and the Ferrari F-50, which I used to complete my M-24.

Our M-24 arrived with a 2-channel Sanwa radio, a mini servo, an Airtronics micro ESC and a 6-cell Kawada AAA battery pack. The chassis has three main segments: the front clip, the battery area and the rear motor pod. These are adjustable to suit bodies of various widths and wheelbases. The front section houses the steering servo that is linked to the left steering block; a pair of wires connected by a wheel collar is used to adjust front toe. The front suspension consists of steering blocks with individual springs, and sliding hub carriers allow you to adjust the front width to accommodate a variety of bodies. The front section is connected to the center in any of four positions to accommodate bodies of various wheelbases, and a spring-loaded bumper absorbs front impacts—a nice touch. An enclosed compartment on the chassis' midsection houses a 6-cell battery pack and also serves as a platform on which you can mount the receiver and antenna.

The rear motor pod is held on the chassis by a flexible, fiberglass-like material that offers adequate rear suspension. The M-24 has a plastic gear differential. It's easy enough to assemble, but I couldn't find a happy medium between locked and loose, so the gears ground. I opted to preserve the gears and locked the diff pieces together.

Kawada M-24 Tripmate $165 (with radio; accepts full-size radio gear)

SPECIFICATIONS

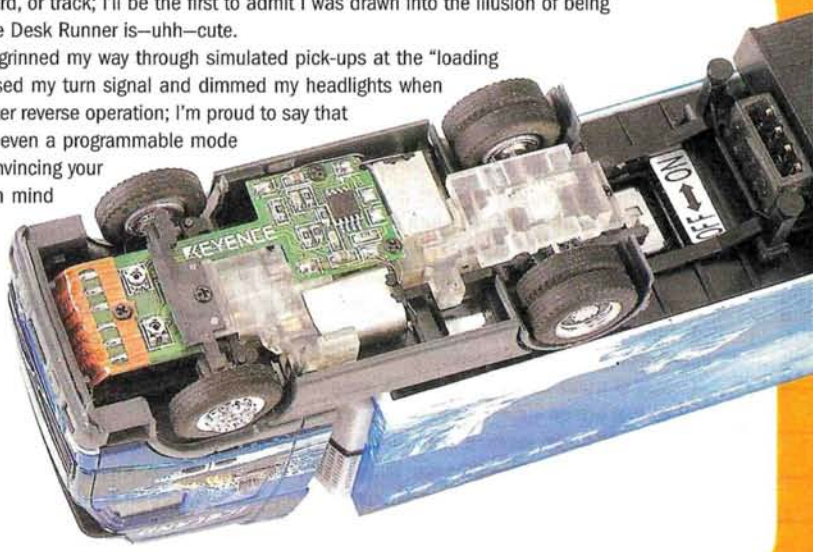
MANUFACTURER	SCALE	WHEELBASE	LENGTH	WIDTH	WEIGHT	TURN RAD.	BODY TYPE	FSRG	RADIO GEAR	TOP SPEED	PRICE
ABC DTM	1/24	100-115mm	174mm	78mm	5.7 oz.(162g)	20 in.	Not inc.	No	Not inc.	10.6mph	$40
Keyence Desk Runner	1/87	141mm	191mm	29mm	4.1 oz. (119g)	8.5 in.	Styrene	No	Keyence	2.5mph	$500
Buds Fun Won	1/18	147mm	247mm	138mm	18.7 oz. (531g)	34.3 in.	Lexan	Yes	Not inc.	19mph	$100
Buds Super Oval Outlaw	1/18	147mm	247mm	113mm	18.3 oz. (518g)	45.3 in.	Lexan	Yes	Not inc.	12.6mph	$80
Kawada M-24 Tripmate	1/24	92-120mm	227.5mm	66-78mm	7.6 oz. (217g)	16.5 in.	Lexan	No	Airtronics	9.6mph	$165
Kyosho Mini-Z	1/28	85-93mm	165mm	71mm	5.8 oz. (164g)	18.5 in.	Styrene	No	Kyosho	12.2mph	$175

DRIVING REPORT

The DR isn't like any conventional RC car that you maneuver around the house, yard, or track; I'll be the first to admit I was drawn into the illusion of being a long-haul driver. As much as I dislike associating this word with anything RC, the Desk Runner is—uhh—cute.

The proportional throttle and smooth steering operation allow great control. I grinned my way through simulated pick-ups at the "loading dock" and then shuttled my cargo across my desk in record time. Of course, I used my turn signal and dimmed my headlights when appropriate, and I used my flashers when backing up. It takes a little effort to master reverse operation; I'm proud to say that I not only took jack-knifing to a new level, but I also made it an art form. There's even a programmable mode so the truck remembers its path and repeats it on command, which is great for convincing your friends that the truck has a new high-tech neuro receiver that operates solely on mind control (they usually believe it).

Even if Keyence had given the DR half as many features, it would still be a blast, but all the functional scale touches really take it to the next level. I do wish that the Desk Runner had a horn; but this isn't a biggie unless you mind supplying your own sound effects.



LIKES
- Scale realism.
- Programmable drive mode.
- Six light functions.

DISLIKES
- Hefty price tag.
- What! No sound effects?

DRIVING REPORT

The 6-cell battery gets the M-24 up and roaring in short order. The motor comes with three pinions. I'm a speed fanatic, so I opted for the largest of the set. A smooth throttle is necessary to launch the car in a straight line. The relatively long wheelbase of the F-50 makes it one of the easiest of the 1/24-scalers to drive, and its rubber tires offer predictable handling. The front bumper worked as advertised. Although it only compressed by 3mm on each side, its ability to deflect and absorb contact is a welcome addition, as is the use of the conventional, clear RC body.

LIKES
- Good performance.
- Extremely adjustable.
- Energy-absorbing bumper.

DISLIKES
- Inoperable differential.
- Puny body posts.

QUICK SPECS
SCALE 1/24
WHEELBASE 92 to 120mm
TOP SPEED 9.6mph

YOU'LL NEED
- **Polycarbonate-compatible paint**

THE 4WD FUTURE

HPI AND ABC BOTH HAVE PLANS to launch micro-platforms that will feature full-time 4WD systems.

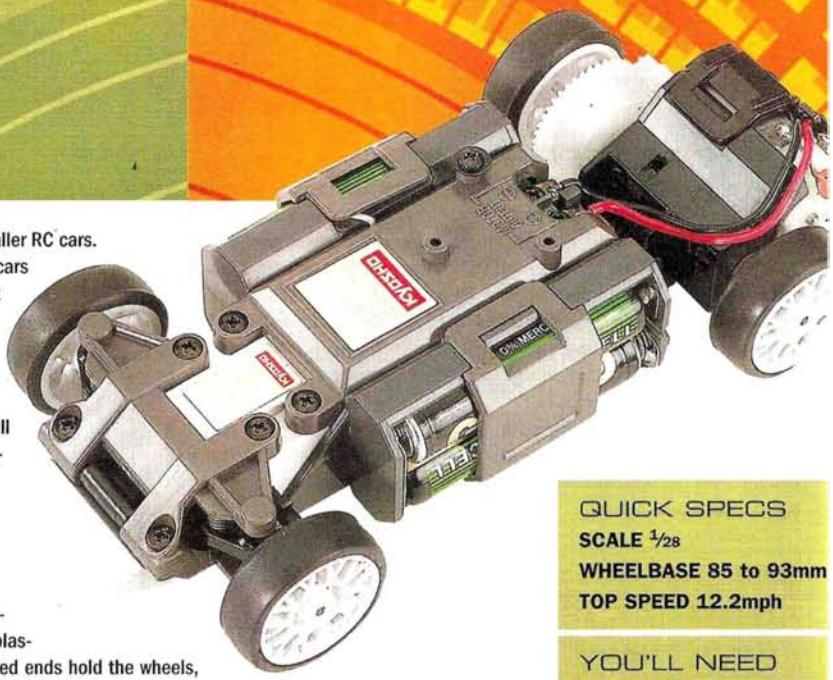
We caught our first glimpse of the HPI Micro RS4 at the New Model and Hobby Show in Chicago. This highly anticipated 1/18-scale entry from the gang at HPI ups the ante by offering a belt-driven, 4WD chassis. So far, a Viper and a BMW M3 are planned and more bodies will follow. While the exact shipping date has yet to be determined, HPI believes the AA-powered touring car will be ready sometime this spring. The Micro RS4 will be offered as a kit and will accommodate conventional "1/10-scale size" electronics.

HPI Micro RS4

ABC opted for shaft drive with its as yet unnamed DTM follow-up, and uses a unique down-the-center motor placement. Otherwise, the pan-car flavor of the 2WD DTM is retained, as is the 1/24-scale sizing that will allow all current DTM (and slot car!) bodies to fit the new chassis.

ABC 4WD Micro

KYOSHO MINI-Z



The Mini-Z gets the credit for refocusing our attention on smaller RC cars. At a mere 1/28 scale, the Mini-Z is the smallest of the cars reviewed in this guide. Kyosho approaches the micro market from a slightly different direction and offers this car completely ready to run. Sure, you have to add batteries and maybe a decal or two, but otherwise, the car is set to go. As a bonus, Kyosho supplies corner dots and turn pylons, too.

The Mini-Z has a modular design and the front end contains all of the radio gear and holds two AAA batteries in a outboard compartments on either side of the chassis. The front suspension allows the front wheels to slide on the kingpins, and inboard springs provide the damping.

Instead of a wire toe link, the Mini-Z's servo has dual output arms that exit on either side of the servo case and are connected directly to the steering block. The rear motor pod is supported by a plate that allows the rear end to flex as required. A plastic pinion turns a white plastic gear differential; the axles' threaded ends hold the wheels, which are equipped with rubber tires.

The highly detailed bodies are molded from high-impact plastic and have a remarkably realistic finish. Currently, the Nissan Skyline, Subaru Impreza, Mitsubishi Lancer, BMW Z8 and Audi TT bodies are available, and the Dodge Viper and Porsche 911 will be along soon.

Kyosho Mini-Z—$175

QUICK SPECS

SCALE 1/28
WHEELBASE 85 to 93mm
TOP SPEED 12.2mph

YOU'LL NEED

- **Batteries (eight AA and four AAA)**

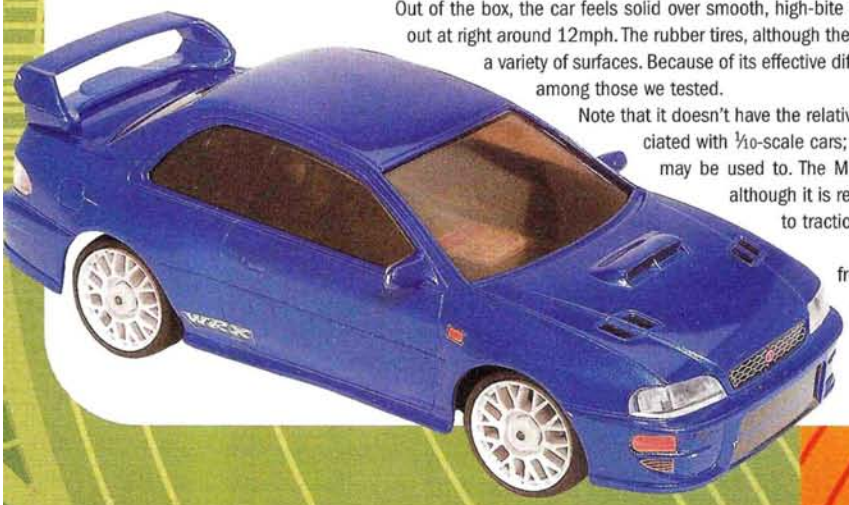
LIKES

- Instant fun.
- Scale realism.
- Long run time.

DISLIKES

- Metal antenna is easily bent out of shape.
- Short radio range.

DRIVING REPORT



Out of the box, the car feels solid over smooth, high-bite surfaces. It accelerates well and tops out at right around 12mph. The rubber tires, although they feel hard, provide impressive grip on a variety of surfaces. Because of its effective diff action, this car is the easiest to drive among those we tested.

Note that it doesn't have the relatively long antenna that is usually associated with 1/10-scale cars; its range is significantly less than you may be used to. The Mini-Z is extremely maneuverable, and although it is relatively narrow, it resists any tendency to traction-roll.

There's a variety of available colors in each of the marques offered. With s frequencies on the 27MHz band available, you and five friends can ru simultaneously. That's where the Z really shines. You have several cars wi identical powerplants—a level playing field to race for fun. ■

SOURCE GUIDE

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RACER news

by Greg Vogel and Derek Buono

Yokomo MR-4TC gets a 2001 makeover

The world champion MR-4TC is getting a more aggressive look for 2001. A new, narrower chassis that brings the batteries and electronics closer to the center of the car and a new motor mount that lowers the motor about 2mm are the major changes. Yokomo plans to offer the upgrade as a set, including the new chassis, motor mount, upper deck and machined-aluminum battery strap. Look for the upgrade in early April.

Josh Cyrul, Daryl Silva Score Big at Snowbird

Trinity's Josh Cyrul almost swept the Pro Mod classes at the Snowbird Nats—almost. Josh took the top spots in Modified Touring Car, 1/12 Modified On-Road, and 1/12 Modified Oval, but he had to settle for second in 1/10 Mod Oval. Associated's Daryl Silva won that race in a nail-biting finish that you can read about in the next issue of *Radio Control Car Action*.

GS takes the race scene by Storm

GS Racing has signed Steve Dunn, Jason Corl and Travis Amezcua to its racing team for the 2001 race season. These drivers will attend all the major off-road races this year and will race the GS Storm 1/8 off-road buggy. In addition to the off-road races, GS will be a presence at all the major 1/8 on-road races and will compete with its 1/8 on-road Sonic.

GS drivers Jason Corl and Travis Amezcua placed third and sixth at the recent U.S. Indoor Off-Road Championships in Ohio. Jason actually qualified second after the very first time he drove the car. Steve Dunn took 15th place overall.

JON ORR JOINS ASSOCIATED/REEDY

The former national champion has made a big change. "J-O-B" will now run a TC3 and 12L3 at all future on-road events. Jon will be using Reedy motors and Jaco tires on both of his rides. He is quite a character on and off the track (see photo); he'll be a great addition to the AE team. In his debut with the 12L3, he won the Crossroads Challenge, and with that victory, he won the Triple Crown for the third time.

6TH ANNUAL MIDWEST GAS CHAMPIONSHIPS

CRCRC in Columbus, OH, was home to the Midwest Gas Champs, where 243 entries were filled out and big-name drivers from as far away as Canada traveled to compete in the 1/8 Buggy and 1/10 Truck classes. Team Losi swept the 1-2-3 positions in the Truck class, with Jesse Robbers, a local hotshoe, taking the TQ and win followed by Matt Francis and Adam Drake. In 1/8 class, Mark Pavidis took the win with his Kyosho MP7.5, Richard Saxton was second with his Mugen, and Jason Corl claimed the third spot with his GS Racing buggy.

GAS TRUCK A-MAIN

POS	CAR	NAME	FROM
1	1	Jesse Robbers	OH
2	3	Matt Francis	CA
3	7	Adam Drake	CA
4	9	Jared Tebo	CA
5	0	Brian Borle	MI
6	4	Richard Saxton	NV
7	2	Allen Horne	MI
8	8	Mark Pavidis	CA
9	6	Kevin Wilson	OH
10	5	Jon Ringer	OH

4WD GAS BUGGY 1/8 A-MAIN

POS	CAR	NAME	FROM
1	4	Mark Pavidis	CA
2	7	Richard Saxton	NV
3	2	Jason Corl	CA
4	1	Greg Powrie	OH
5	3	Kevin Wilson	OH
6	6	Travis Amezcua	CA
7	0	Greg Waller	CA
8	5	Jared Tebo	CA
9	8	Dave Henry	CAN
10	9	Doug Von Mosch	KS

SITE SEEING

HEADCASE.RCPLANET.COM/

Tired of having a one-color paint job on your full-option racer? Get a pro to paint your bodies for you—check out Headcase RC Graphics! We have already taken advantage of its new and exciting paintwork; in future issues of *Car Action* you'll see many bodies painted by Headcase. Scan this website for pictures of Headcase painter Jason Hocks' cool paint jobs. This site has both contact information and an excellent gallery of his work.

SPEED SHOP

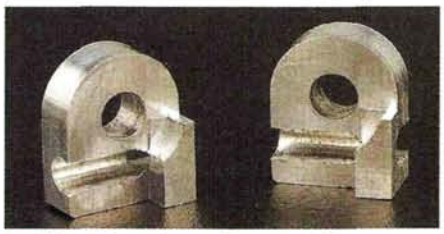
OFNA 2-speeds

Finger-type 2-speeds are a thing of the past. They shift too hard, which causes a sudden burst of speed that can throw off handling. Because of their hard shifting, they are also more prone to breakage. OFNA is revamping its 2-speed lineup with a clutch-type 2-speed. Inside each kit is everything you need to bolt in the unit: a new layshaft, clutch shoes, gear housings, gears, clutch bell and hardware, as well as a step-by-step instruction manual. The units are available for the HPI RS4 as well as OFNA's Nitro OB4, Nitro Z10, and a kit for the HODR, Blazer and all the Ultras.

2-speed transmission—part no. 35016 (for Nitro OB4), 35015 (for Nitro Z10 and HPI RS4), $119.95; 35011 (for HODR, Blazer and Ultras), $124.95.

OFNA Nitro Z10 kit

OFNA HODR, Blazer and Ultra kit



Trinity brake clips

Swap your set of plastic Losi brake clips for a set of these machined Trinity clips. With their bright blue-anodized finish, they'll certainly improve the looks of your Triple-XNT.

Brake clips—TK5059, $16.99.

Schumacher Axis 2 upgrades

If you're looking to deck out your Axis 2 in lightweight carbon-fiber parts, then check out the new releases from Schumacher. The chassis is a dual-deck bonded carbon-fiber chassis that also includes the shim plates. The X-type carbon-fiber battery brace not only holds down the batteries but also adds rigidity because of its one-piece design that spans all four hold-down posts. There is also a replacement pack to convert the three-piece top deck to carbon fiber, and a transponder mount is also included. The carbon-fiber front and rear shock towers are available individually. And the last items you see in the picture are the aluminum hex hubs that feature O-ring pin retainers.

Carbon-fiber chassis—U2379Y, $69.99.
Battery brace—U2392N, $18.99.
Top deck—U2380A, $21.99.
Rear tower—U2381B, $12.99.
Front tower—U2382C, $12.99.
Alloy wheel hex—U2401A, $9.99.

Yokomo GT-4 options

Yokomo GT-4 owners who want to update their rides are in luck. This month, we have a slew of new options to tell you about, and most of them are aluminum. There are 7075-aluminum radio-plate supports for both left and right sides of the car, and an aluminum rear bulkhead support that includes a ball bearing for the brake actuator. The side belt tensioner is also machined from aluminum and includes ball bearings and all the hardware necessary to bolt it to the car. Front and rear aluminum shock towers eliminate any chance of flexing, and last on the alloy list are the clamping hex hubs. Yokomo also has universal drive shafts to eliminate the stock dogbones.

Right radio-plate support—ZE-116SRA, $36.99.
Left radio-plate support—ZE-116SLA, $36.
Rear bulkhead support—ZE-300RSA, $16.75.
Side belt tensioner—ZE-BTS, $22.25.
Shock towers (F/R)—ZE-017FA/ZE-017RA, $34.
Clamping hub—ZE-011C, $10.
Universal drive shafts—ZE-010FS, $26.25.

RC Speed Freaks *video*

This is probably one of the hottest RC videos we've seen in a long time. XXX Main's "RC Speed Freaks" video (an edited version of the original XXX Main "The Video") contains nothing but untamed RC car jumping, racing and stunts such as an ⅛ car jumping three full-scale cars on a BMX track, an ⅛ buggy versus a BMX rider and a driver driving his car off the roof of a building; the result isn't pretty. In the video, you'll also see big-name drivers such as Josh Cyrul, Richard Saxton, Matt Francis, Jared Tebo and others tear up the tracks at some big events.

RC Speed Freaks video—Video2, $19.99.

TRACK THREADS

Trinity Picco shirt

Here is the perfect shirt for racers who power their nitro vehicles with the potent Trinity Picco powerplant. The front sports a double Trinity Picco logo, which is also printed on the back, along with the Monster Horsepower Fuel logo. The shirts are available in black or white, with long or short sleeves.

Shown: short-sleeve shirt in white—RC9768 (L), RC9769 (XL), $16.99; RC9770 (XXL), RC9771 (XXXL), $18.99.

5 QUESTIONS

Age: 23

Last big win: Trinity Road Course Challenge 2000

Favorite track: CRC Raceway, Rome, NY

Sponsors: Xpress, Team Orion, Team CRC, KO Propo, Protoform, Pro-Line, GM Racing, Jaco, SMC, Kimbrough, Cypress Platinum, CRC Raceway

When I'm not racing:
I work, work, work. Did I mention that I work?

Radio Control Car Action: What got you into racing?
Mike McMahon: I have been into RC for about 13 years, and I decided to start racing so I could meet women. I wish I could find the guy who told me that racers get a lot of women. I don't think he meant RC. Seriously; there is nothing like the pressure of competition, and even though they are smaller than full-size racecars, RC cars involve the same thrill.

RCCA: When you were younger, was there a lot of local talent at your track, or were you "the man" to beat?
MM: Actually, I grew up with quite a few racers who have made it in professional racing. I think it was to all our advantage to have really fast races together; we pushed one another to go faster. The one person who I feel helped me the most was Jon Orr. When I was younger, he was who I looked to to be fast.

RCCA: The IFMAR On-road Worlds was an experience for everyone who attended. Did you have any memorable moments?
MM: That was the first time I visited Japan, so it was an eye-opening trip. It was very difficult to get around, especially because the Japanese language doesn't have the same characters as ours. It's hard to figure out the difference between the words for "small tree" and "sea monster." It was pretty humorous talking to people who had no idea what you were saying; you could pretty much say anything you wanted. You could have some fun with that.

RCCA: You run for Xpress, which is a very small company here in the U.S. How many team drivers does it have? Is there a disadvantage to having such a small team?
MM: Besides me, there is one other: Mike Swauger. There definitely is a disadvantage when it comes to setup. A larger team can have ten drivers at a race experimenting to find what works, while we have only two. On the other hand, we can concentrate on our cars together and get them hooked up.

RCCA: Is it difficult to have a full-time job and find time to practice and race?
MM: I'm pretty lucky that my employer understands when I need time off; I might not get paid for it, but I get it off. It is actually better that racing isn't my main focus; if it were, I think I would burn out faster. Having a job helps me realize that it's still fun to race.

UNDER THE HOOD

MIKE McMAHON'S XPRESS SETUP FOR HIGH-TRACTION CARPET

Mike reworked the front suspension to use Yokomo parts. He said it greatly increased durability indoors.

The rear suspension was left stock. The Xpress comes with plenty of red aluminum and graphite parts.

FACTORY OPTIONS

■ Red aluminum screws—part nos. vary ■ Belt tensioner—968-61

SETUP

FRONT	REAR	
Shocks		
–piston	2-hole	2-hole
–oil	80WT	60WT
–spring	Neo blue	Neo orange
–limiter	None	None
Shock stay	Out	Out
Suspension arm	Custom	Out
Ride height	4.5mm	5mm
Camber	-1°	-1°
Caster	5°	0°
Toe-in/out	+1°	2.5°
Swaybar	None	None
One-ways	None	None

MODIFICATIONS

- Rear belt tensioner (made from a front tensioner)
- Yokomo bellcranks (eliminate bump-steer and lower the CG)
- Yokomo front arms and caster blocks (add strength for indoor racing)
- Gold shock shafts
- Lunsford titanium turnbuckles
- Neo springs

EQUIPMENT

RADIO SYSTEM: KO Propo Mars
STEERING SERVO: KO Propo PS-2001 FET
ESC: GM V12
MOTOR: O.S. RZV99b Team Orion Chrome Touring
GEARING: 31/128
TIRES: (F/R) Jaco Purple-Orange/Purple
RIMS: Jaco
TRACTION ADDITIVE: CRC Down Force

HOT MOD HOW TO

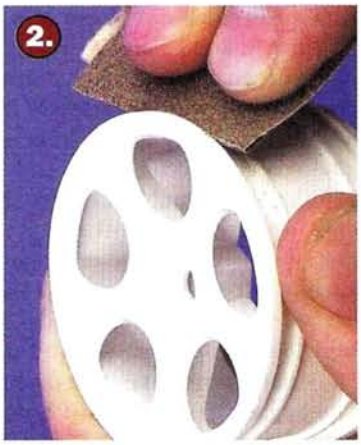
TIRE MOUNTING MADE EASY

We've seen it happen many times at our local racetrack: cars driven by novices—and even seasoned race veterans—limping around the track with a tire halfway off the rim. Not only is this one of the most embarrassing ways to make your way around the track, but it can also cost you the race. Here's the proper way to glue up a set of tires.

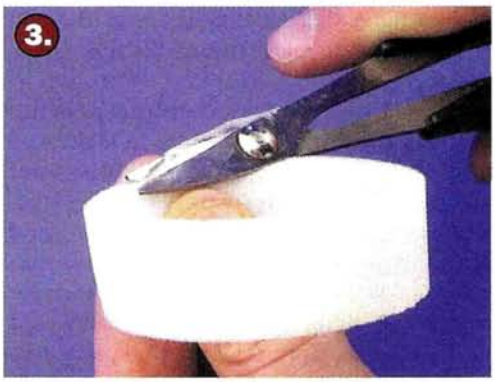
YOU'LL NEED

- Motor spray or denatured alcohol
- Rag
- Scissors
- CA glue
- Sandpaper

■ **STEP 1. Tire and rim prep.** Spray a good amount of motor spray or denatured alcohol on a clean rag, then wipe the bead area of the rim and tire. Go over the same areas two or three times using a fresh piece of soaked rag each time. This will remove any oils or residues left on the rims after they were molded.



■ **STEP 2. Scuff the rim.** The rim's bead area is so smooth that the glue may not stick. Use a fresh piece of sandpaper to roughen it, and clean it again with motor spray.



■ **STEP 3. Cut the bead and foam.** When tires are molded, some have extra flashing on the bead. If your tires have flashing, it will prevent them from seating properly in the rims. With a pair of scissors, carefully remove any extra flashing. While you have your scissors in hand, cut the inner and outer edges of the foam insert. Doing this will help the foam seat in the natural curve of the tire's sidewall instead of bunching up and having too firm an edge.

■ **STEP 4. Install the tire.** Insert the foam in the tire, and make sure it is properly seated inside; then slide it onto the rim and into position. With the heel of your hand, pull the tire back slightly and apply CA glue to the rim. Move to the next unglued section of the tire and repeat. Do this on both sides. You may want to use a rubber band around the edge of the tire to help the bead seat in the rim. As an extra precaution, run a bead of glue around the mating edge of the tire and rim.

Like any project or assembly, the more time you spend on it, the better the final product will be. The more time spent prepping and gluing, the better the tire will adhere to the rim.

LAST LAP

Do you have any pre-race rituals? Any track superstitions? Tell us!

I have to have the end of the pit table. I also sit and stare at the body and think of anything but the truck and the upcoming race. My friends think this is weird, but hey; I finish every race.

—Randy Hynd

Before every race, on the way to the track, I must listen to "Are You Experienced?" by Jimi Hendrix and have an Ultimate Cheeseburger and Coke from Jack in the Box. If those things don't happen, I feel as if something just ain't right.

—Eric Quertermous

When I race in the nitro class, I won't turn on my engine until someone else does it first. I think it's bad luck, and I'll lose that heat!

—Jorge E. Hinojosa

Drink a sixer before the race in less than five.

—Shadow Racer

[Editors' note: he's talking about a sixer of Yoo-Hoo—we hope.]

I wouldn't call them superstitions—more like a set way I like to do things. My pit gets set up the same way every time, and I look over the car before taking the first practice lap. The only thing I would really call a ritual is the music I listen to in my CD player while I'm working on my car. It makes me feel good and keeps my mind focused. To me, racing is at least 60 percent mental.

—David Alford

I have a big thing with my pants. I can't race unless my pant leg is over the tongue of my shoes. I just feel weird if I don't do that.

—Murphy Slaw

NEXT MONTH'S QUESTION

What is the one hop-up option on your car that you couldn't race without?

Respond by clicking "Last Lap" at www.rccaraction.com, or email your responses to gregv@airage.com.

K&N WINTER BLAST 2001

by Matthew Higgins

Every winter, oval racers from all over New England and beyond (some from as far away as Canada) brave snow-covered roads to make their way to the high banks and tight corners of the legendary K&N R/C Speedway in Stafford Springs, CT, for the annual Winter Blast. This Ozite-covered track has frequently hosted the ROAR Carpet Oval Nationals; it boasts a 195-foot-long racing line, 7-degree banks in the straightaways followed by a steep 14 degrees in the tight corners. At this year's race, a two-day format was adopted to run the three rounds of qualifying and the single, do-or-die round of Mains. Unlike at previous Winter Blasts, only two classes were run: 1/10-scale Stock and 1/10-scale Modified. To keep the playing field as level as possible, Trinity Paradox motors were chosen as handouts for the stock-class runners.

1/10-SCALE STOCK A-MAIN

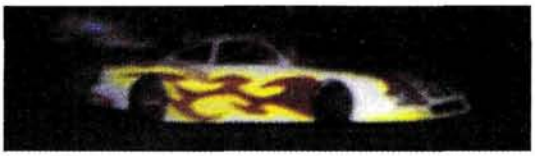
Mike McDermott and his New Wave, Trinity-powered Hyperdrive Adrenaline 10 took advantage of his pole position on the starting grid of the highly competitive stock class and led the eight-car field into turn one. He was followed closely by Pace Gendron, John Hauenstein and Bob Pedone. The tough K&N track has only one line (or groove), and each driver was fighting for the same piece of carpet when an inevitable early accident reshuffled the group behind McDermott; this allowed him to break away from the field. Hauenstein and Charlie Stewart got the worst of the deal in the accident and drifted to the back of the pack. Pedone worked his way up to third and eventually passed Gendron at the end of the 11th lap for second place. Unwilling to give up the lead without a fight, McDermott closed the door on every attempt of Pedone's to gain the lead. On lap 36, Pedone got a great run off the high banks of turn two and drilled McDermott's trunk, sending the leader into a spin. The aggressive move cost them both, as Bill Bombard sailed into the lead with his Trinity SwitchBlade 2. The race concluded with a good battle for the lead as Steve Wilhelm took the point for two laps before Bombard reclaimed the lead with Steve Salvas taking over second. Bombard's winning run was 56 laps in 4:02.50, with Salvas crossing the coil 1 7/10 seconds behind the leader.

A-main Modified winner Mark Smyka.

Stock A-main drivers.

1/10-SCALE MODIFIED A-MAIN

Greg Hartman started on the pole, but Nick Dorocz wasted no time charging



up from the third-place starting position and into the lead. After some early jousting for position, Mark Smyka with his New Wave, Mighty Motor-powered Associated 10L3 muscled his way up from fifth to second. After the dust of the early battles had settled, the order was Dorocz, Smyka, Hartman, Bill Bombard and Greg Pace. From lap 2 to lap 59, Dorocz had as much as an entire straightaway lead. With a lead that large, Dorocz seemed to get on and off the throttle as smoothly as he could to allow his Hyperdrive Fantom-powered car to coast through the corners—a more conservative driving style. As time began to run out, Dorocz slowed in the end. Smyka took over the lead without a fight and led Dorocz across the coil for the last time. Smyka finished his run with a 62/4:02.61.

New track owners Steve Schmid and Jim Tierinni did everything they could to make sure that the 12th running of the Winter Blast went well, and it was definitely successful. Unfortunately, the unpredictable New England weather dumped so much snow before and during the race weekend that the overall turnout was somewhat modest, but 63 drivers competed in the 1/10-scale Stock class. With this year's race serving as an example of how future events will be run, next year's Winter Blast should be just that: a blast. ■

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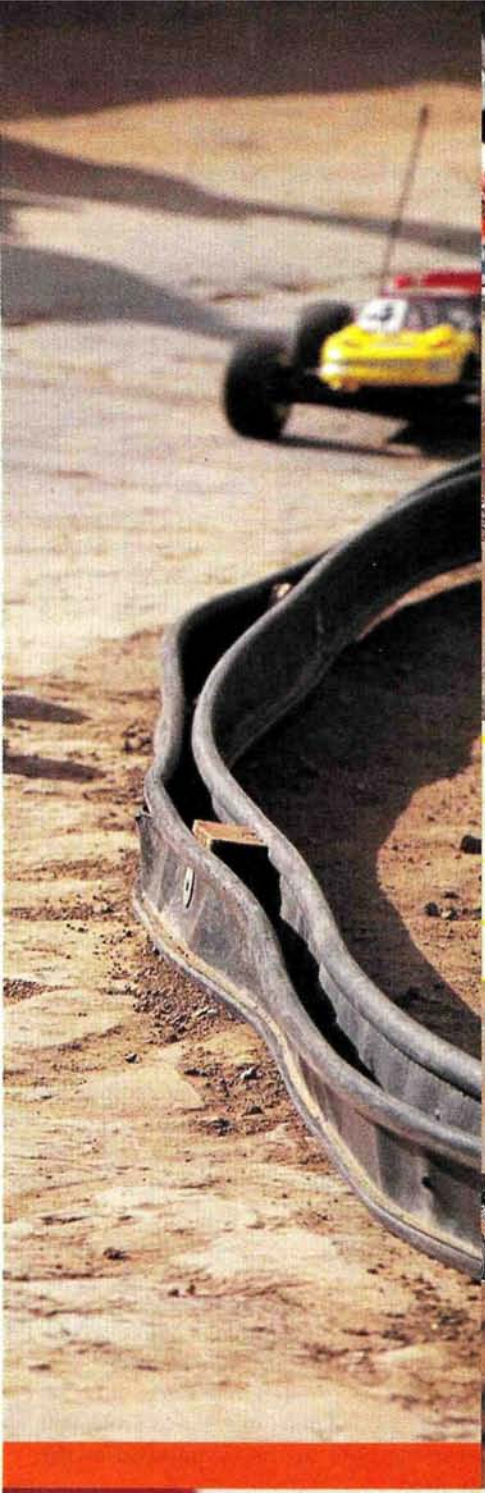
The A-Team takes all

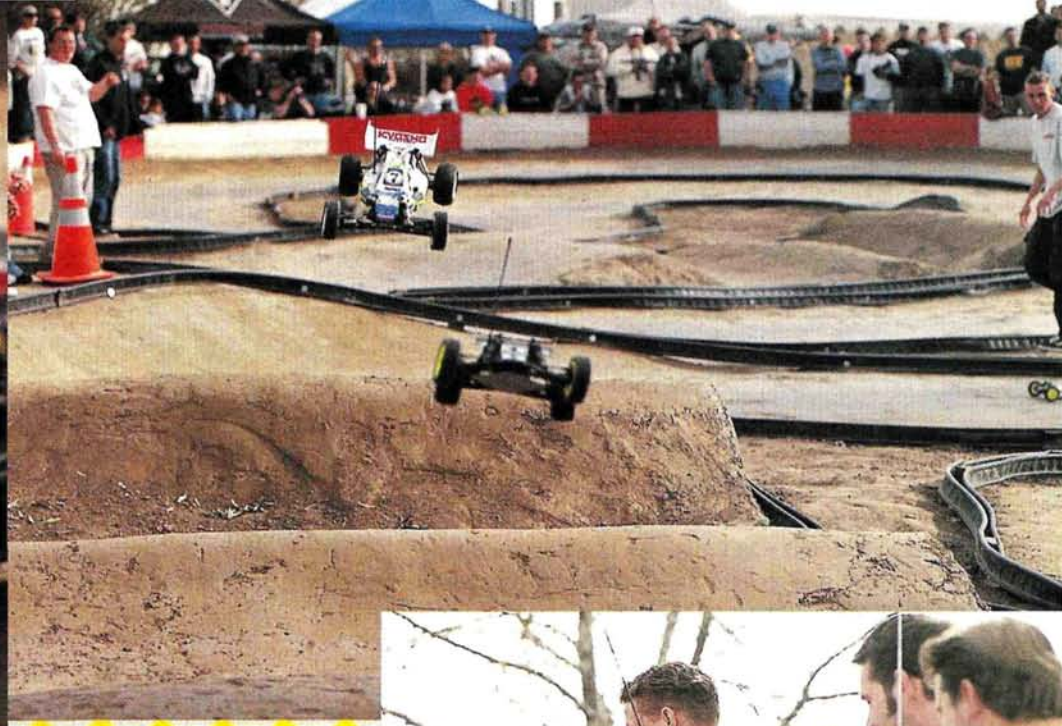
Reedy Race of Champions

Sponsored by RADIO CONTROL CAR ACTION and Novak Electronics

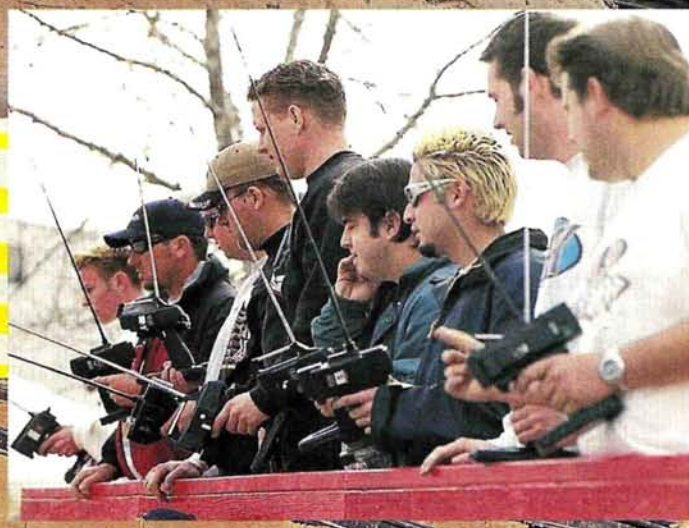
by George M. Gonzalez

Racers from around the country travel to Southern California every year to compete at the Reedy Invitational Race of Champions, which is actually a giant birthday party for veteran motor builder Mike Reedy. The latest was Mike's 60th birthday, and he was honored for 30 years of knowledge, of leadership in and passion for the RC hobby. Many of his friends, more than 140 racers in the Open classes and approximately 20 Invitational racers showed up. Racing action was nonstop, and everyone got a slice of birthday cake, too.





Life on the drivers' stand: the calm before the storm!



Mike Reedy (right) gets ready to cut the first slice of cake. Hey, watch where you point that knife!

Right: Oh, turn marshal ...! Scott Hughes zones out for a minute. Hey, wait a minute ... some of his teammate's trucks are in this pile.

THE TRACK

The 13th Reedy Race was sponsored by *Radio Control Car Action* and Novak and was hosted by Hot Rod Hobbies in Saugus, CA. The staff at Hot Rod Hobbies set up a challenging outdoor course and kept the event flowing smoothly. Team Orion/Team Losi factory driver Jimmy Babcock—a friend of the pro drivers—provided the play-by-play and some colorful wisecracks and general razzing.

The track featured giant double and triple jumps, a long straightaway and a high-speed sweeper section. The hard-packed dirt surface's strategically placed ruts caused the cars and trucks to suddenly pop wheelies and catch air for no apparent reason. The drivers had difficulty setting their vehicles up for the extra-bumpy track, but everyone faced the same conditions, so the playing field was level. To keep the track surface consistent, after every round of qualifiers, the crew blew off the surface with a gas-powered leaf blower and watered it before each round of the Invitational heats and Open Mains.

Sunshine and cool, 60-degree temperatures made it a pleasure to be outdoors, especially because the forecast had threatened rain (it did come down in buckets on the next day). The racers took a break on Saturday to wish Mike Reedy a happy birthday; they presented him with three birthday cakes and a giant card signed by all. Mike had the honor of cutting the first slice of cake, but a line of hungry racers soon formed, and that was Mike's cue to go and build some motors.

SCHEDULE

The Truck class debuted this year (see "4WD out; trucks in" sidebar). The three Main courses were 2WD Open, Truck Open and Invitational. As always, slots filled up quickly, and the first 150 drivers to sign up competed in the Open. The winners of the 2WD Open and Truck Open are automatically invited to race in the Invitational that follows the Reedy Race; the competition was extremely tight. Drivers in those classes competed in four qualifying rounds—ample opportunity for a fast run. The top 10 qualifiers in each Open then competed in single A-mains to determine the winners of each class.

The Invitational drivers were invited because of their racing accomplishments during the previous year in ROAR-sanctioned competitions, and Open winners from the previous Reedy Race were also there. Invitational drivers competed in six rounds of 2WD buggy racing on Saturday and six rounds of Truck racing on Sunday—a total of 12 heats each. The lowest score in each class was thrown out, so only 10 heats counted. Points were awarded according to finishing position in each heat: (first place—1 point, second—2, third—3). The lowest score determined the champion.

4WD OUT; TRUCKS IN

The Reedy Invitational Race of Champions was originally modeled after the IFMAR Electric Off-Road Worlds that includes classes for 2WD and 4WD electric buggies. Although the Reedy Race was once an international event frequented by drivers such as Masami Hirosaka (Japan), Jukka Steenari (Finland) and Craig Drescher (England), it has become mostly an American race in which only few international drivers now compete. For this reason, the 4WD class was omitted and Modified Truck was added in its place. This makes sense considering that trucks are immensely popular in the U.S. An equal number of racers signed up in the 2WD and Truck Open. This is much better than fielding two heats in 4WD and five or six heats in 2WD, as in past Reedy Races.

OPEN A-MAIN

• **2WD.** The action was packed as eight of the 10 drivers finished on the same lap, and only10 seconds divided the first- through eighth-place positions. Top qualifier and Team Associated driver Jim Gard led for most of the race, but pressure from Vince Stolo forced a mistake that cost him the lead and a couple of positions. Team Associated driver Jared Tebo consistently flanked the leaders and squeaked into second. Stolo took the win, Tebo second, and TQ Gard settled for third. Looks like Vince Stolo will play with the big boys in the Invitational at the next Reedy Race.

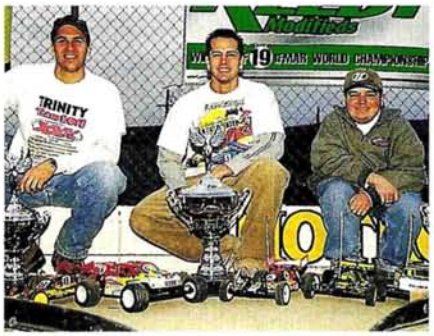
Top three in 2WD Open (left to right): Jim Gard (third), Vince Stolo (first) and Jared Tebo (second).

• **Truck.** Jim Gard was the guy to beat here as well: his truck was in the front of the A-main grid. TQ Gard shot out in a blaze of glory, waved goodbye to the rest and maintained a consistent lead. A mistake would have cost him the win here, too, so instead, he played it safe and maintained a steady pace. The real race was for second and third, as Brent Thielke, Philip Atondo

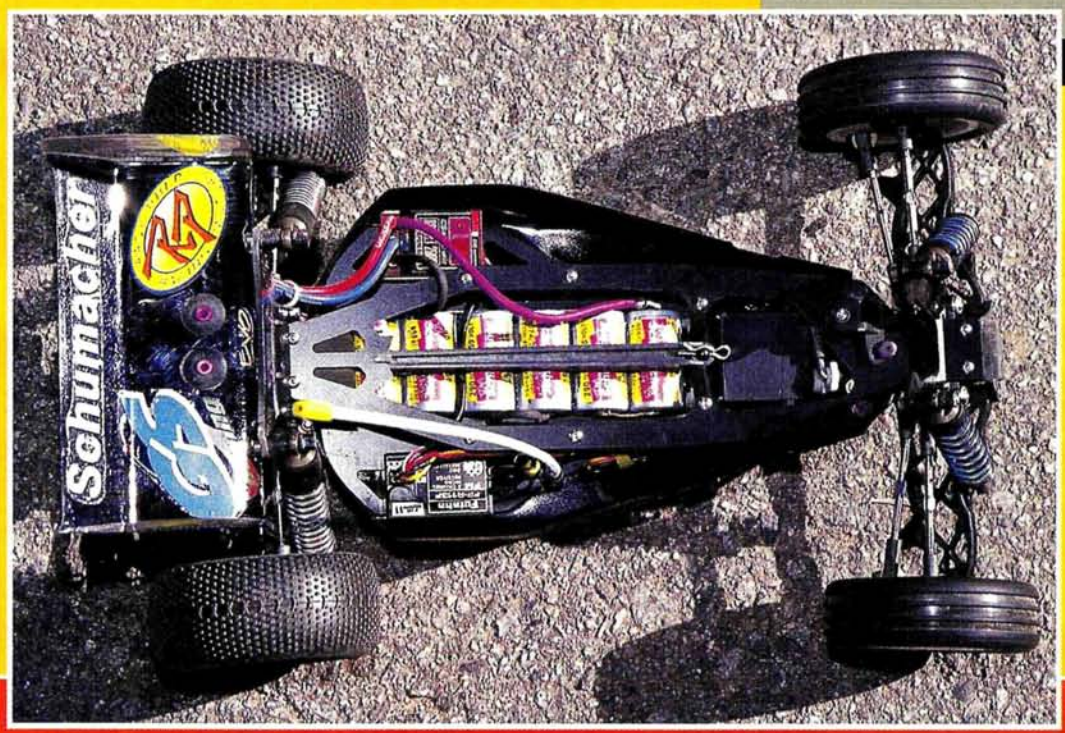
Top three in Open Truck (left to right): Philip Atondo (third), Jim Gard (first) and Brent Thielke (second).

and 2WD champ Vince Stolo fought it out. Thielke claimed second after a photo finish that left Atondo in third. With this win, Jim Gard became an Invitational candidate.

• **Invitational.** In this class, the racing is always exciting and extremely close. With six rounds of 2WD and six rounds of Truck heats using a round-robin scoring system, it's difficult to predict a winner. The names of Team Associated/Reedy factory driver Billy Easton and Team Trinity/Team Losi factory driver Brian Kinwald toggled back and forth on top of the chart throughout most of the race. After the last heat in the sixth round, Kinwald and Easton were tied with 8 points each, but Kinwald's throw-out round was better.



The Invitational's top three (left to right): Matt Francis (third), Billy Easton (first) and Brian Kinwald (second).



new IN THE PITS

New Fireblade chassis

Several Schumacher drivers tested a prototype of the new graphite double-deck chassis for the Fireblade 2000 buggy. The prototype chassis shown in the photo uses only one set of chassis braces instead of two, and this allows the chassis to flex more and ensures a better ride on rough surfaces. New battery slots position the pack farther rearward to increase rear traction. This chassis is only available as an option. A similar S1 composite double-deck chassis will be included with future Fireblade kits as a running change.

<<<

Reedy Ti modified

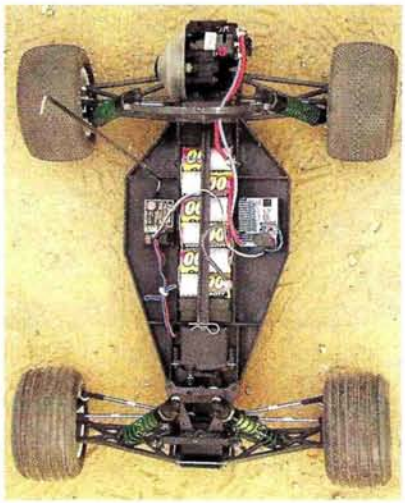
>>>

I spotted a new motor on Mike Reedy's bench while I was cruising in the pits; its shiny titanium finish caught my eye. The motor shown in the photos is a prototype of Reedy's new TI motor that has a new can with a simulated titanium finish. According to Reedy, this motor uses new magnets that are 15 percent stronger than any of those used in previous Reedy motors. The new can design optimizes the increased magnetic field and has unique cooling veins that circulate air around the armature. The motor's new endbell has vented heat sinks and Reedy's standard brush damping system. An all-new armature blank that provides higher torque is also included. The TI motors will be available in all of Reedy's popular Millennium winds at a suggested retail price of around $95.

In Truck, Billy Easton won his heat in round one, while Kinwald finished third in his round, and that put Easton back on the top. Things tightened up again after the second round, when Kinwald pulled off a win in his heat and Easton finished second in his. Rounds three through six determined the winner: Easton won heats three and five and finished third in heats four and six for a score of 8 points. Kinwald finished ninth in round three (no doubt his throw-out round), second in rounds four and five and fourth in round six for a total of 12. Team Trinity/Team Losi driver Matt Francis, who placed second or third in most of his heats, also had 12 points in Truck.

When the 2WD and Truck Invitational scores were combined, it was no surprise that Billy Easton was declared the Reedy Invitational class winner with 16 points. Brian Kinwald,

Vince Stolo's 2WD Open-winning RC10B3.



Jim Gard drove this T3 to a Truck Open victory.

winners

2WD OPEN

FIN.	QUAL.	DRIVER	CAR	MOTOR	BATTERY	ESC	RADIO	TIRES	BODY
1	2	Vince Stolo	B3	Banzai	SMC	LRP	Airtronics	Pro-Line	Pro-Line
2	3	Jared Tebo	B3	Reedy	Reedy	LRP	Airtronics	Pro-Line	Pro-Line
3	1	Jim Gard	B3	Reedy	Pro-Match	LRP	Airtronics	Pro-Line	Pro-Line
4	5	Brent Thielke	B3	Race Prep	Pro-Match	LRP	Airtronics	Pro-Line	Protoform
5	9	Andrew Swanson	Triple X	Trinity	Trinity	Novak	Airtronics	Losi/Pro-Line	Losi
6	6	Greg Monise	Triple X	Peak	Peak	Tekin	Airtronics	Losi	Losi
7	10	Ryan Smith	B3	Reedy	Reedy	LRP	Airtronics	Pro-Line	Pro-Line
8	4	Phillip Atondo	Triple X	Trinity	Trinity	Novak	Airtronics	Losi	Losi
9	8	Richard Lake	B3	Reedy	Reedy	LRP	Airtronics	Pro-Line	Pro-Line
10	7	Jeremy Kortz	Kyosho	Peak	Peak	Novak	JR R1	Pro-Line	Kyosho

TRUCK OPEN

FIN.	QUAL.	DRIVER	TRUCK	MOTOR	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Jim Gard	T3	Reedy	Pro-Match	LRP	Airtronics	Pro-Line	Pro-Line
2	2	Brent Thielke	T3	Race Prep	Pro-Match	LRP	Airtronics	Pro-Line	Protoform
3	4	Phillip Atondo	Triple X-T	Trinity	Trinity	Novak	Airtronics	Losi	Losi
4	5	Vince Stolo	T3	Banzai	SMC	LRP	Airtronics	Pro-Line	Pro-Line
5	9	Mark Mendenhall	T3	Birdman	Reedy	LRP	Airtronics	Pro-Line	Pro-Line
6	10	Scott Reynolds	Triple X-T	Birdman	Birdman	Novak	Airtronics	Losi/Pro-Line	Losi
7	8	Geoff Monise	Triple X-T	Peak	Peak	Tekin	Airtronics	Losi	Losi
8	6	Jeremy Felles	Triple X-T	Banzai	N/A	Novak	Airtronics	Losi/Pro-Line	Losi
9	7	Jeremy Kortz	Kyosho	Peak	Peak	Novak	JR R1	Pro-Line	Kyosho
10	3	Jared Tebo	T3	Reedy	Reedy	LRP	Airtronics	Pro-Line	Associated

INVITATIONAL

Final pos.	Total points	Driver	Chassis	Motor/Battery	ESC
1	16	Billy Easton	Associated	Reedy	LRP
2	20	Brian Kinwald	Losi	Trinity	Novak
3	21	Matt Francis	Losi	Trinity	LRP
4	24	Travis Amezcua	Associated	Reedy	LRP
5	26	Brian Dunbar	Losi	Trinity	GM
6	27	Lloyd Dassonville	Associated	Reedy	LRP
7	28	Mark Pavidis	Associated	Reedy	LRP
8	33	Jason Corl	Losi	Trinity	Novak
9	33	Scott Hughes	Associated	Reedy	LRP
10	38	Scott Brown	Losi	Trinity	Novak

Billy Easton took the Invitational honors with his RC10T3 and B3.

who has already won the Reedy Invitational class twice, had 20 points and settled for second. Matt Francis scored 21 to claim third.

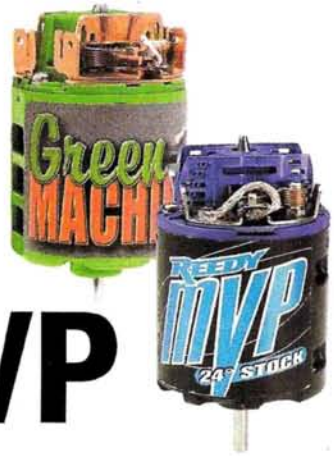
UNTIL NEXT YEAR

This year's Reedy Race of Champions was a blast! Holding it outdoors was a nice change of pace, but an outdoor race in January can be risky—even in Southern California. The entire staff of *Radio Control Car Action* wish Mike Reedy a belated happy birthday and congratulate Billy Easton on his victory. Congratulations also to Vince Stolo and Jim Gard for their wins in the Open 2WD and Open Truck classes, respectively. Hope to see you all there next year. ■

Trinity Green Machine 3 Reedy MVP

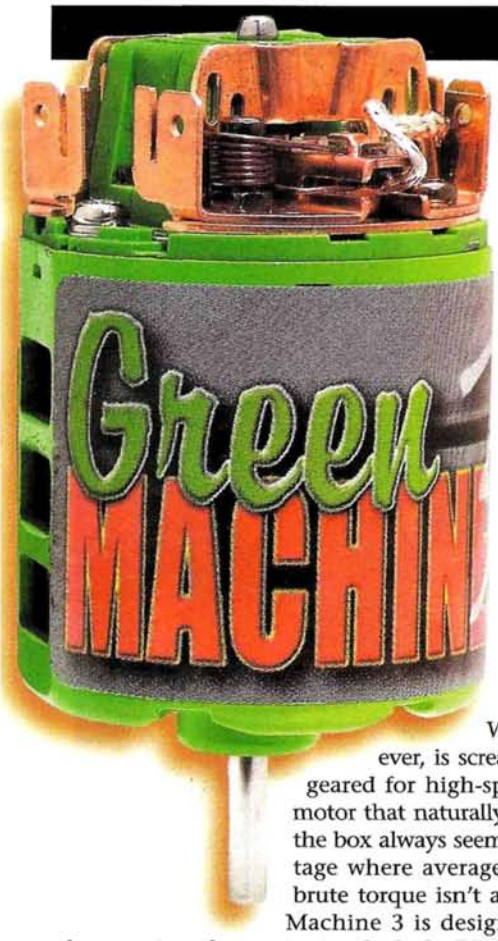
Back-to-back testing of stock's big guns

by Steve Pond



"For every action, there is an equal and opposite reaction." Sir Isaac Newton must have known something about ROAR-legal stock motors. To get more rpm out of a stock motor, you have to sacrifice torque and vice versa; that's just the way it is. Stock-class motors can offer more torque or more rpm, but they can't offer both. Stock motor designers are constantly bumping up against the challenge of trying to balance rpm and torque in an effort to produce the ideal stock motor. But a single stock motor design will never be everything to everyone. This point is well illustrated by the latest shots fired from the electric motor big guns, Trinity and Reedy. Trinity's Green Machine 3 and the Reedy MVP are both designed to win races, but as the numbers show, each uses a different formula for stock-class speed; see for yourself.

Trinity Green Machine 3



Trinity is the first motor manufacturer to step "outside the box" and, instead of trying to replace one stock motor with another that will be "everything to everyone," it has introduced a new motor—the Green Machine 3.

The nearly one-and-a-half-year-old P2K is well-known by experienced racers as being just about the best all-around motor in stock racing. It has great torque and best-in-class overall power output for getting out of the corners and down the short straights quickly. What the P2K lacks, however, is screaming rpm. It can be re-geared for high-speed applications, but a motor that naturally pulls higher revs out of the box always seems to have a slight advantage where average speeds are higher and brute torque isn't as important. The Green Machine 3 is designed specifically for the aforementioned scenarios in which the P2K lacks an advantage.

MOTOR CAN

The GM3 uses a can that's very similar to that of the P2K, but there's one notable difference—the vents. The P2K can has two smaller vents cut in an angled indentation. The GM3 has three large vents cut into the flat part of the can, and there aren't any indentations. There are also sizable vents in the bottom of the can. The larger side vents offer much more breathing than other stock motors', and they make visual inspections a snap, but these aren't the primary reasons for their existence. The size of the vents helps reduce the effect of the magnets, and this essentially allows the motor to rev higher than would be possible with the P2K can.

As required by the rules, the flat-sided can has a notch in its upper edge where it mates with the endbell to lock the timing in at 24 degrees. Additionally, the flat-sided can offers the ultimate protection against tampering because it's nearly impossible to rotate the endbell, even without the indexing tab in place. The can is made of 1.25mm-thick material similar to that used for the P2K. (I previously reported that the P2K's can was formed of 1.4mm-thick material, but I goofed and measured the thickness including the label.) The new can is a bright lime green instead of having the cosmetic copper plating found on the P2K.

ENDBELL

The endbell is a direct carryover from the P2K. The molded portion is identical in dimensions; the only difference is the bright green composite that gives it the "Green Machine" look. Like the P2K, the GM3 has built-in surface-mounted capacitors, so you don't have to install external capacitors.

The GM3 is also a "copper head": its endbell has the same copper hardware as the P2K. Copper is more conductive, and that improves efficiency. The downside of the copper is that it's rather soft and can easily be bent or damaged.

The brush hoods house laydown serrated brushes that, on the Pro models, are secured with polarized springs. Vibration-

The GM3 uses a full-length; triple-rotor armature to produce more rpm than have ever been possible with the P2K.

damping springs are also installed in the brush hoods to prevent the brushes from chattering at high rpm. These are somewhat unique in that they're installed in the top of the brush hoods rather than in the bottom (the configuration of most other motors).

Finally, the GM3 still has what I call "Siamese springs." The spring posts and springs are mounted on the same side of the endbell, and that requires unique brush springs. Conventional springs can't be used on the positive side of the motor. If you're a tinkerer and like to experiment with different spring combos, be sure to buy the proper replacement springs.

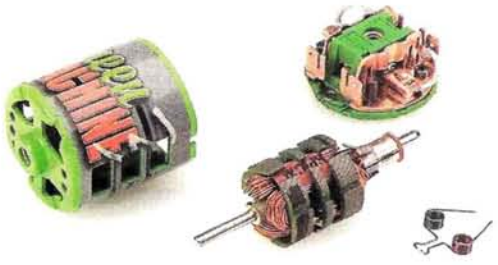
ARMATURE

The GM3 armature is very different from that of the P2K. It uses the same stepped silicon steel laminations, but that's where the similarity ends. The P2K comes with a double-rotor short-stack armature; the GM3 has a full-length triple-rotor armature. The large gaps in the GM3 armature's center section are supposed to allow higher revs. It also has a tapered shaft and an armature tag for identification purposes.

TESTING

I had two motors to test, and I tested both straight out of their packing to check off-the-shelf performance. The first round generated average power numbers in the mid- to high 120W range; torque was down in the 160 Nmm range (remember that Newton stuff?); and maximum rpm hovered in the low 29,000 range.

I stripped both motors down, cut each of the comms and replaced the brushes. I installed Trinity no. 4499 serrated silver brushes and left the stock polarized springs in place. The 4499 brushes are a little harder than average, so I had to give them a good 20 to 30 minutes of break-in so that the serrations were worn about halfway. A couple of pulls generated power in the high 130W range, but this was a more typical run: power output—a respectable 132.1 watts at 13,99rpm; torque peak—159.4 Nmm; peak rpm—a screaming 30,855. Efficiency is better than average at a click over 70 percent, but you'd be hard pressed to find a form of racing in which a stock motor's efficiency actually matters.



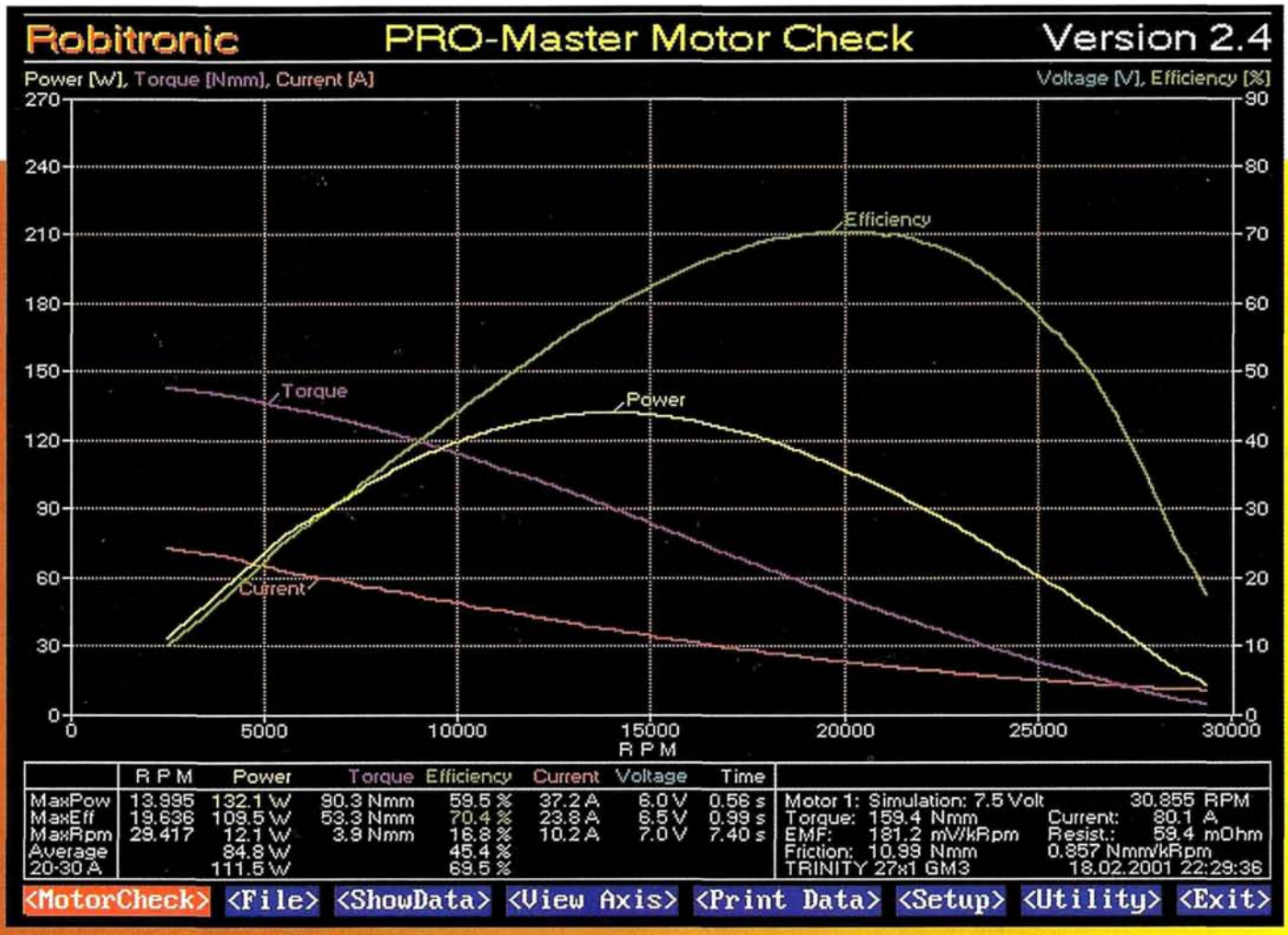
On each side of the GM3's flat-sided can are three very large vents that offer maximum cooling airflow and affect the magnets' strength to increase rpm. The steel timing ring used to fasten the endbell to the motor is a little soft and can easily be bent if the endbell screws are tightened too much.

With the obvious exception of the green composite used for the molded portion, the endbell used for the GM3 is standard-issue P2K hardware. Copper brush hoods and heat sinks improve conductivity, but copper is soft and more easily bent and damaged. Note the surface-mounted capacitors built into the endbell.

THE VERDICT

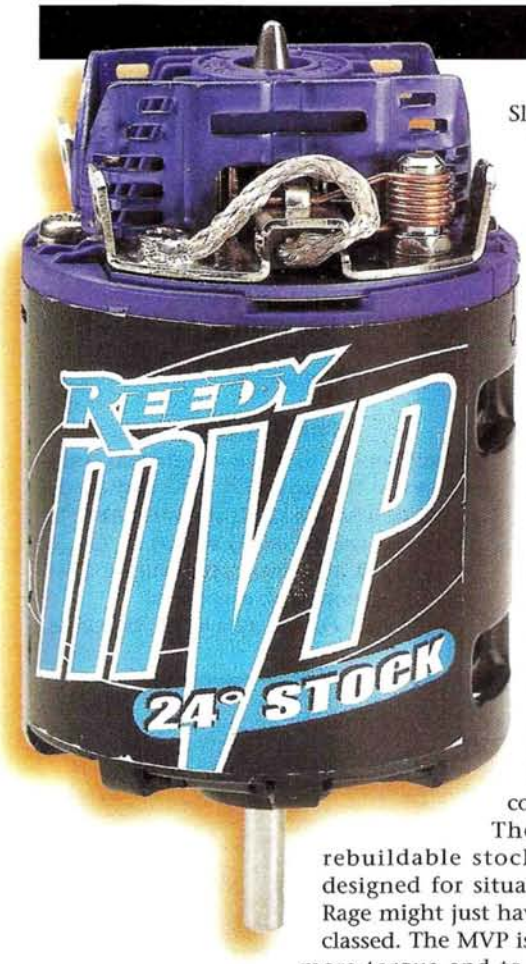
Trinity set out to make a high-rpm counterpart to its successful P2K, and it succeeded. There's no question that the GM3 has the potential to rev; in fact, it clicked off a higher rpm reading than any stock motor I've ever tested.

This all comes at a cost, however,



and that is a reduction in torque. For people who like their motors to rev high but aren't as concerned about torque, this is for them. I firmly believe, though, that the P2K is a better all-around motor, and frankly, I don't think the GM3 design will dethrone the champ; in fact, its performance profile is very similar to that of the Reedy Rage Type-R. It should be well suited to the types of applications in which the Type-R is effective. It certainly adds an extra dimension to a motor line that has already experienced great success.

Reedy MVP



Slightly less than two years ago, Mike Reedy jumped into the rebuildable stock motor class with the Rage Type-R motor. This free-spinning, almost 30,000rpm motor became popular on oval courses and others on which high average speeds are the norm. It did have a weakness, though: is wasn't very strong in the torque department. It was well suited to average drivers but just a tad slower getting out of the tighter corners, and for accomplished racers, inches and fractions of a second count.

The new Reedy MVP rebuildable stock-class motor was designed for situations in which the Rage might just have been slightly outclassed. The MVP is designed to deliver more torque and to make better use of the new high-voltage cells from Sanyo and Panasonic.

• **Motor can.** MVP's literature suggests that the can is formed of 1.4mm steel, but I measured only 1.25mm. I don't think it matters much—just a point of fact. There's a notch in the top of the can that's indexed to the endbell. It allows the timing to be fixed, but the round can design is still a weakness where the prevention of tampering is a concern.

The can's bottom has a lot of vents that were designed to allow good airflow even when butted against a motor-mounting plate. The can's side vents are smaller than those on the Rage Type-R. This means there's more material between the magnets, and that strengthens the magnetic field. This is important to the MVP motor because excessive side venting would have weakened its stronger magnets. The downside to having smaller vents is that the armature tag is barely visible, so technical inspection is more difficult. When a positive armature identification is required for a complete inspection, the armature will almost always have to be removed.

"C4" magnets are installed in the can; according to Reedy, they are 15 percent stronger than the magnets of any stock motor now on the market. These magnets and some of the new can features seem to account for the motor's increased torque.

• **Endbell.** The molded section of this new endbell design is lighter and has large vents between the heat sinks to allow more cooling air to flow; the Type-R didn't have any vents. The blue-anodized-aluminum heat sinks on the brush hoods are considerably larger than those on the previous motor, and they're vented, so they increase the cooling-surface area.

The chrome-plated laydown brush hoods seem to be the only parts carried over from the Rage. They have vibration-damping springs on the bottom.

Finally, the endbell doesn't have surface-mounted capacitors built into it; this is a popular feature (at least in theory) in competitive stock motors.

• **Armature.** The double rotor armature with silicon steel laminations is referred to as a "6HL." The trademark holes drilled through the web and crown of each pole are the same as on the Rage; in fact, this looks as if it's exactly the same armature, though in the Rage, it has a "3HL" designation. The 6HL looks identical and has the same part number, so if there is a difference, I can't tell.

To conform with the rules, the commutator is locked in at zero degrees, and an identification tag is epoxied into place.

• **Brushes and springs.** The motor I tested came with Reedy 767 laydown serrated brushes and copper-colored brushes. I've never found it easy to identify Reedy brush springs; these seem to be 150-degree (approximately) springs made of 0.52mm wire.

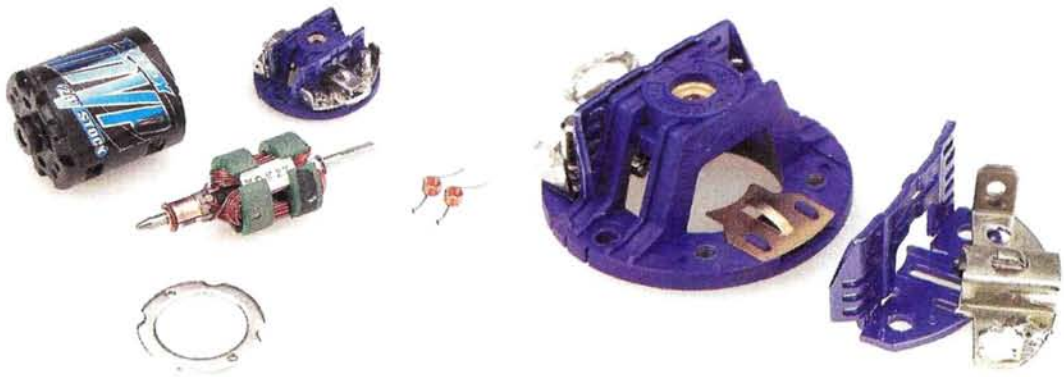
TESTING

Every test starts with a few dyno runs straight out of the box. On the first pull, the MVP put out 128.4 watts of power at 12,952rpm. Max torque is a healthy 180.2 Nmm and the max rpm hovered around 29,700.

Having never been one to trust the accuracy of a comm cut or the quality of care given even to a Team motor, I chucked the MVP arm in a lathe and gave it a clean cut and a fresh set of 767 serrated brushes. I gave the MVP about 12 minutes of break-in at 4 volts and then reinstalled it in the dyno for further testing.

The motor put out a very respectable 134.9 watts of power at 12,738rpm, jumped to 197.5 Nmm of torque, and a healthy peak rpm of 29,755. Spin-up time to max power was 0.43 second—much shorter than with the Rage, which does well to get below 0.55 second. A 0.12-second difference might not sound like

The MVP's "6HL" armature looks identical to the Rage Type-R's "3HL; it's a double rotor with a hole drilled through the web and crown of each pole. The holes are intended to modify the magnetic flux path and improve performance.



Far left: the can has considerable bottom venting, but the side vents are smaller to improve the strength of the magnetic field and increase torque. Left: the MVP's endbell is more "open," so it enhances the flow of cooling air into the motor. Vibration-damping springs are installed on the endbell below the brush hood and heat sink. The large aluminum heat sinks enhance brush cooling.

much, but it's a 20-percent improvement. There's nothing to write home about concerning efficiency, but with the new-generation 2400 Ni-Cds and 3000 stock metal-hydride cells, efficiency doesn't come as high on the wish list.

THE VERDICT

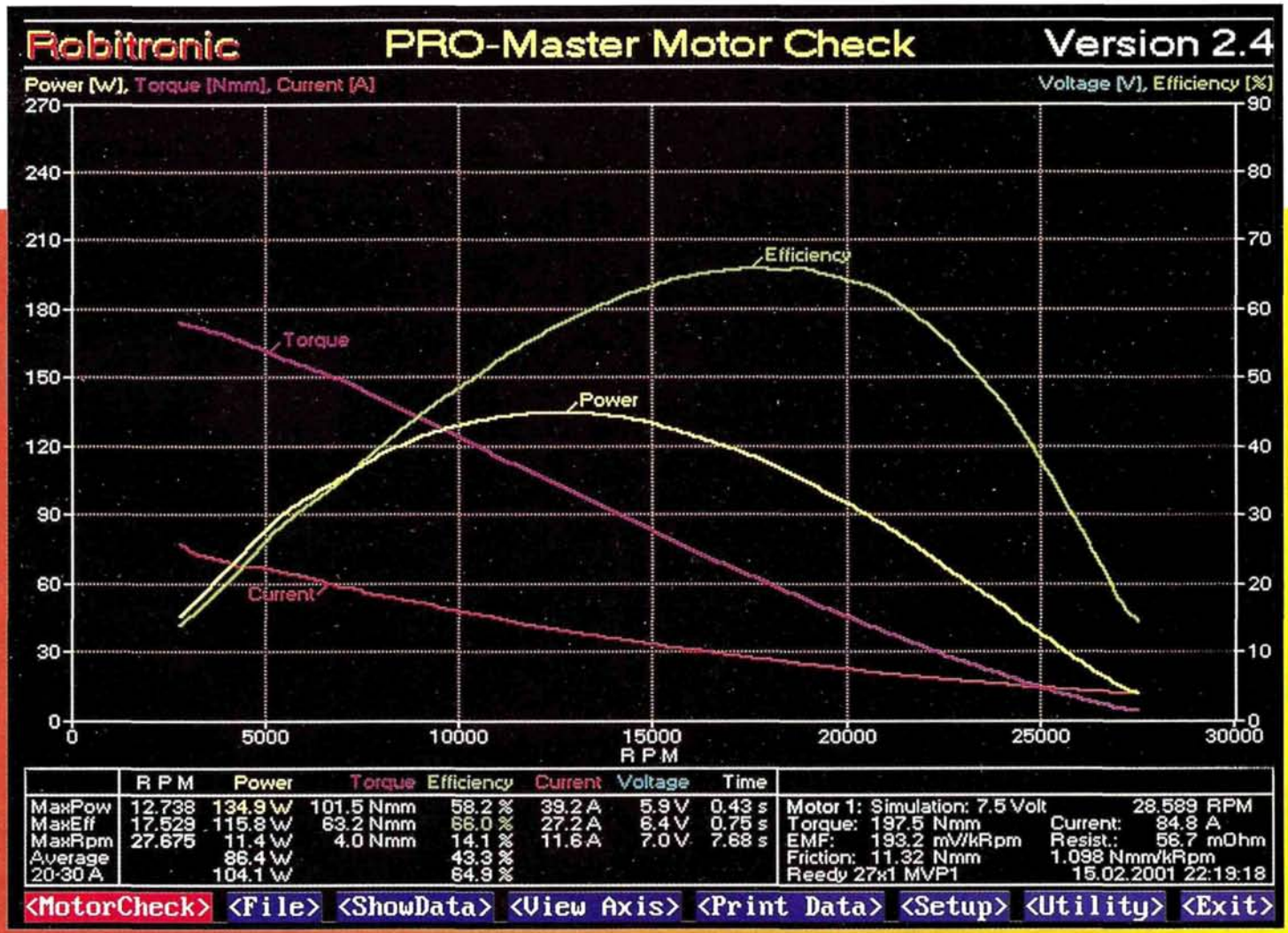
There's no question that the new MVP is much more suited to average racing conditions than the previous Rage. The increase in torque should get you out of the corners with much more authority; power production is very good, and that should allow the MVP to keep pace with any of the strongest motors.

The MVP strikes a good balance and should be a much better all-around motor for serious stock-class racers than the Rage. It even beats a good P2K by some 2,000rpm, so it's well suited to high-average-speed applications, but it will certainly be much more at home on tracks that are traditionally considered to be "P2K country." ■

SOURCE GUIDE

REEDY MODIFIEDS
3585 Cadilac Ave., Costa Mesa, CA 92626;
(714) 850-9342;
www.teamassociated.com.

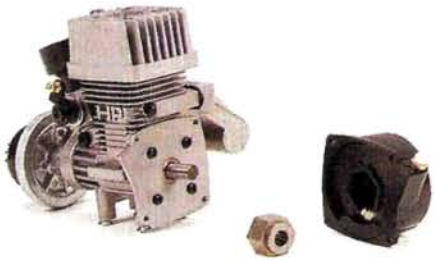
TRINITY PRODUCTS INC.
36 Meridian Rd., Edison, NJ 08820; (732) 635-1600;
fax (732) 635-1640;
www.teamtrinity.com.



BY CHRIS CHIANELLI AND PETER VIEIRA

Pull-start rebuild time

Tug-tug-tug-tug-tug-tug-SNAP! Uh-oh. Your engine's pull-starter cord just let go and disappeared into the starter housing, leaving you with a T-handle, some frayed cord and no way to get your engine running. You could just buy a new pull-start assembly, but it's much cheaper to simply replace the cord. Here's how:



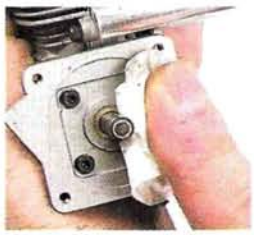
Assembled pull-start units (left) are available but cost about $25 or $30. Components are also available for a more cost-effective solution.

1 Remove the pull-starter. Most pull-starters are held on the backplate with three or four screws. Remove them, and then gently pull the starter assembly off the engine. The one-way bearing (it's the octagonal metal piece) may stay on the crankshaft, or it may remain inside the pull-starter. Pop the one-way bearing out of the starter, if it's still in there.

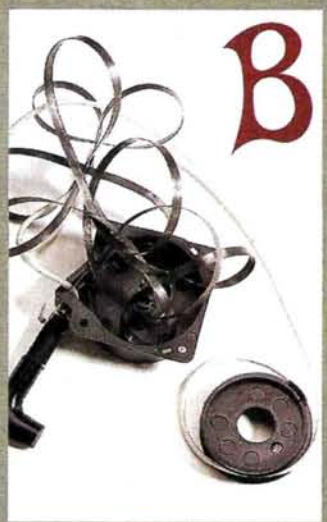
2 Remove the spool. Stop! Before you yank the spool out, look into the now empty octagonal recess where the one-way bearing was; you will see a thin spring tucked into a slot in the starter housing. Carefully lift out the tongue that fits into the housing, and release the spring. Now gently lift out the spool with the spring coiled inside (you may have to pop off a retaining plate first). If you don't release the spring from the housing first, it will uncoil into a tangled mess when you pull the spool out.

There are basically two styles of pull-start units. The spring in the orange type (above left) is coiled in the recessed back of the spool, making the spring easy to reload should it spring out on you. This type is used by Kyosho, HPI and O.S. The black type, shown above right, is used by DuraTrax and Traxxas, has the spring loaded in the spool housing, making it more difficult to work with. When removing the spool with this type, you must push the spring end out of a slot in the spool's back with a screwdriver; otherwise you will unleash the spring.

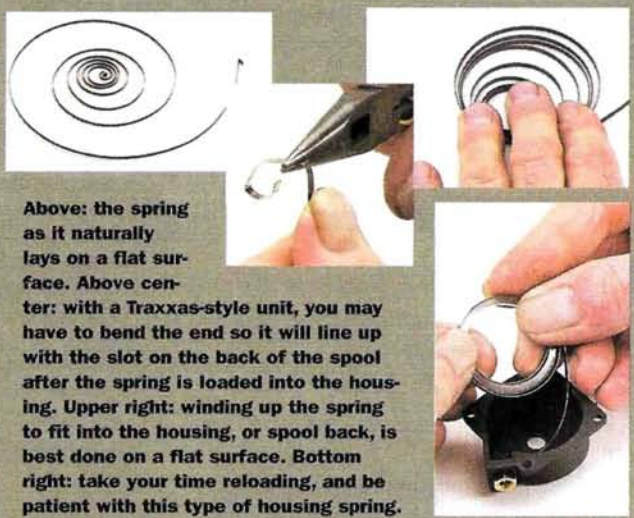
3 Housing inspection. Now wipe away any fuel residue and grit that may have accumulated within the pull-starter housing and on the engine's backplate; the abrasive action of the grit and constantly being soaked by fuel residue probably contributed to your starter cord's failure. It's also wise to check the housing's cord-exit hole; if it has any burrs or sharp edges, your cord will continue to wear out prematurely. Carefully bevel the inner and outer edges of the hole so the cord will slide in and out smoothly without snagging on any sharp edges. Skip this step, and you might find yourself reading this "how to" again.



Boing!



"The spring just went off like a possessed Slinky. Now what?" Don't worry; it's easy to rewind the spring. First, untangle it; you should find that it wants naturally to coil itself loosely, as shown here. Next, feed the spring into the spool with your thumbs, taking care to hold it in place as you go so it doesn't jump out again. When the spring is back in the spool, you can pick up at Step 3 and complete the rebuilding process.



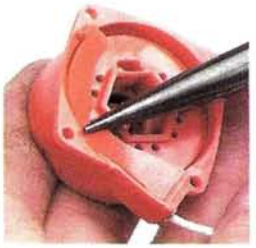
Above: the spring as it naturally lays on a flat surface. Above center: with a Traxxas-style unit, you may have to bend the end so it will line up with the slot on the back of the spool after the spring is loaded into the housing. Upper right: winding up the spring to fit into the housing, or spool back, is best done on a flat surface. Bottom right: take your time reloading, and be patient with this type of housing spring.

4 Thread the new cord. If the new cord isn't knotted, tie a knot in one end before you thread the spool. Tie the knot as close to the end of the cord as possible, and pull it as tight as you can. Trim off any cord that protrudes from the knot, use a cigarette lighter or a match to melt together any frayed strands of cord that remain, and place a dot of CA glue on the knot to prevent it from becoming undone. Remove any remnants of the old cord and then thread the cord into the spool; pull the knot tightly into the recess. Now wind the cord around the spool, and move on to the next step.

Melting the polyester cord stops unravelling and makes it easier to work with.

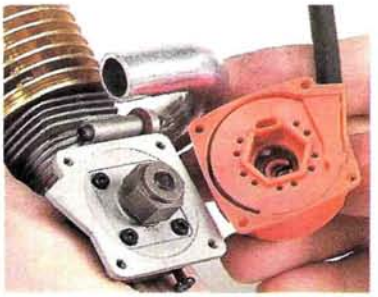
Wind counterclockwise as you look from the front of the spool.

5 Reinstall the spool. Thread the end of the cord through the eyelet in the housing, then tie a loose knot in the cord to prevent it from slipping back inside. Place the spool in the starter housing, and rotate it to take up the slack in the cord. Now it's time to reinsert the spring. Using a pair of needle-nose pliers, reach into the hexagonal recess and wind the spring a few turns to preload it; then press it into the slot in the housing. Use your thumb to hold the spool down, pull the cord out a few inches and then release it; it should retract completely. If it doesn't, release the spring, wind it more tightly, and try again. When you're satisfied with the spring tension, replace the retaining plate if your pull-starter is equipped with one.



6 Thread the T-handle. Pull about 6 inches of cord from the pull-starter, then wrap it once around a clothespin; this will prevent you from accidentally letting the cord retract completely into the housing. Slip the T-handle standoff onto the cord (you can reuse the original or make a longer, custom standoff with a piece of fuel tubing) followed by the T-handle itself, then tie a tight knot in the end of the cord. Trim off any leftover cord, seal the frayed end with a lighter and add a drop of CA to prevent the knot from undoing. Release the clothespin, and give the starter a test-tug. Everything should now work like new! Now all you have to do is reinstall the housing on your engine.

7 Reinstall the pull-starter. Start by placing the one-way bearing on the crankshaft. Test it for proper rotation; it should spin freely when rotated counterclockwise and lock up when turned clockwise. Slip the starter housing and spool over the bearing, line up the screw holes, and tighten everything. Use a little thread-lock on the screws. You're ready to hit the track. ■



SAVE THAT STRING

If you're a chronic cord-breaker, it's a good bet that you're yanking that pull-starter like it's a flooded lawn mower. Don't do that! A little wrist motion is all you need; hearty, whole-arm pulls that unwind the starter cord to its limit lead to breakage. If you just can't break the big-pull habit, try this: gently pull the starter cord out to its limit, then allow about 6 inches to retract back in. Using a permanent-ink marker, color the cord where it enters the housing. If you see that colored section appear while you're tugging at the starter, you'll know you're close to the cord's limit, and you'll be able to back off before you break something.

Here, the cord is fully extended. If you see this happening a lot when you start your engine—you *will* be rereading this "Piston Power."

BY KEVIN HETMANSKI

Building the ultimate Tamiya rig

When you think of Tamiya trucks and aftermarket parts, the Clod Buster naturally springs to mind. But Tamiya offers another line of trucks—the Tractor Truck series of road-going 18-wheelers—that's easy and fun to customize. These trucks bring together Tamiya's expertise with injection-molded detail, long history of technical innovation and the usual top-quality materials and finishes. Best of all, there are plenty of custom options available to make your truck unique and more like the real big rigs.

Tamiya's Volvo Globetrotter is a beautifully detailed piece that looks just like the real thing! It has realistic suspension, a working fifth wheel, a very detailed body and more.

PROJECT GLOBE-TROTTER

For this month's project, I built a fully dressed version of Tamiya's Volvo Globetrotter. It's the latest addition to the company's line of tractor-trailer trucks, and it has the usual Tamiya truck features. Its injection-molded, multipiece body is the star of the show—side skirts, tinted windows, detailed grill, side mirrors, windshield wipers and more.

The chassis is made of two C-channel aluminum rails with plastic cross-members—a simple, ladder-type design. The suspension is controlled by scale leaf springs and aluminum dampers with internal springs. A manual-shift 3-speed transmission drives the single rear axle with a long aluminum drive shaft. Inside the rear axle, you'll find a metal-gear differential. The entire drive train is supported by metal bushings, and the functional fifth wheel may be latched and unlatched by hand.

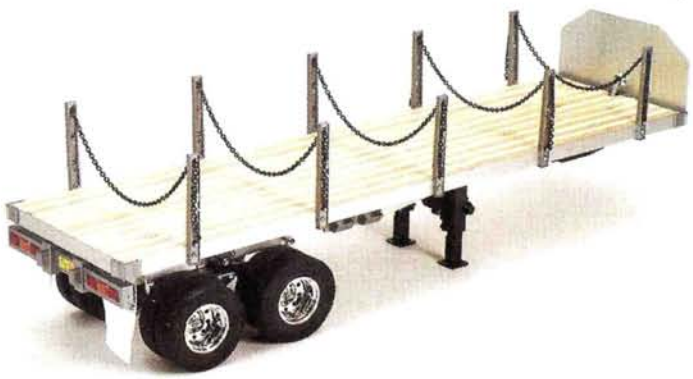
Those are the basics; to make my traffic-stopper, I added these:

• **Flatbed trailer.** Tamiya offers four trailers—a box, tanker, pole and flatbed. I chose the detailed flatbed trailer because it has a lot of features that interest me. The main part of the chassis is a long piece of sheet aluminum, and it's finished with two L-shaped pieces. The suspension and axles are at the rear. The axles ride on metal bushings and are housed in plastic tubes; the tubes are attached to scale leaf springs with long screws. Small aluminum "shocks" add to the scale realism.

The trailer's front has support legs that are spring-loaded and automatically retract when the truck backs into the trailer; when you disconnect the trailer, you have to extend the legs manually. The flatbed floor is constructed of thin strips of wood that are laid down one by one and held by double-sided tape. The trailer sides are slotted and can be moved inward or outward to fit the outermost strip of wood.

The optional light kit makes this truck shine at night. Turn the wheels, and the blinker light comes on; let off the throttle, and the brake lights shine. ▶

This flatbed trailer is one of four in the Tamiya garage. It features a real wooden floor, adjustable chains, working support legs and realistic suspension. Just as it does for its tractor trucks, Tamiya offers many hop-ups to enhance the trailer's realism. ▼



PARTS LIST

Tamiya

Volvo Globetrotter—part no. 56312.
Flatbed trailer—56306.
Light kits (tractor/trailer)—56501/56502.
Motorized leg-support kit—56505.
Sound-effects set—56510.
Oil-filled shocks—56503.
Aluminum rims (F/R)—56508/56509.

Futaba

4-channel radio—4VF-FM.

LRP

ESC—F1 Super Reverse.

Trinity

P2K Pro motor—RC2117.
Monster Maxx batteries (2)—RC5896.

Futaba 4VF-FM 4-channel radio

All the Tamiya rigs require 3-channel radios to operate the transmission, steering and throttle properly. I added the sound effects unit, so I had to use a 4-channel radio. Even if you don't have the sound unit and need only a 3-channel radio, buy a 4-channel; you might need that extra channel later on for a special function. The radio has two-stick controls, servo-reversing switches, rechargeable battery pack, rechargeable receiver battery, receiver switch, charge jack, four S3004 servos and a 7-channel receiver. I installed a telescoping Tamiya antenna on the truck's chassis to hide the wire receiver antenna and to make the truck look that much more like the real thing.

I need a 4-channel radio to run all the electronics in my truck; I use a Futaba Skysport. The left stick moves the support legs up and down on the trailer and activates the air horn; the right stick controls forward and reverse and steering.

• Tractor and trailer light kits. One of the easiest ways to make any RC kit more realistic is to add lights. This usually involves gluing a housing and a light bulb to the headlight section of a Lexan body; ABS plastic bodies usually have molded sections on the grill for you to add bulbs.

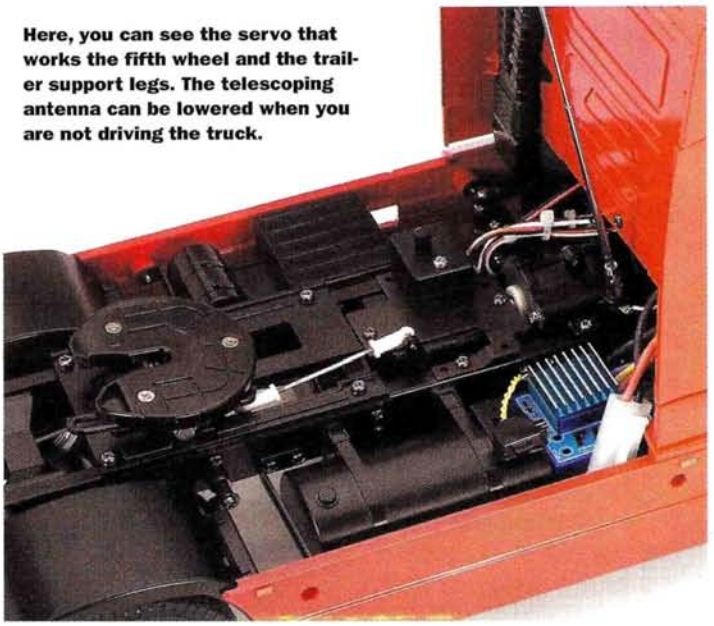
For the tractor-trailer trucks, Tamiya went all out on the light kit. It's powered by the battery that powers the rig, and a large circuit board controls all of its functions. The lights are all attached to wires that are long enough to easily reach wherever they have to go. They all run to specific points on smaller circuit boards that can be mounted just about anywhere on the chassis. These smaller circuit boards are connected to the main board with large plugs.

Four switches allow you to turn the unit, headlights, roof lights and hazard lights on and off. The brake lights are controlled by two wires that run to the motor's positive and negative leads. When you let off the throttle, the brake lights automatically light up.

When you use reverse, you hear the safety backing up beeper through a small speaker. A small microswitch attached to the steering servo controls the turn signals.

• Motorized leg-support kit. The support legs on the Tamiya trailers are cool: they can be pulled down or retracted when you attach or detach the trailer from your rig.

Here, you can see the servo that works the fifth wheel and the trailer support legs. The telescoping antenna can be lowered when you are not driving the truck.



Running Gear

I chose an LRP F1 Super Reverse ESC for my truck. It has a smooth throttle response, can handle a hot motor and, as you have probably guessed, it has reverse. I wanted a motor with enough torque and speed for my rig, so I installed a Trinity P2K Pro. A Trinity Monster Maxx battery supplies lots of power and long run times.

I replaced the truck's stock shocks with a set of functional, good-looking oil-filled Tamiya units. They reduce the bounce in the truck's steel leaf springs.

Just when you think you can't make these trucks look any more real, Tamiya offers aluminum rims. They look great and come with covers to hide the ugly wheel nuts.

◀ These electronics are cool. Finding the space to mount them is not too much fun, though; it takes time and patience to install all these goodies.

Tamiya offers these beautiful aluminum rims for all of its tractor trucks and trailers. The aluminum cover hides the mounting nut and cleans up the rim's look. ▼

SHOP TALK

I see that Trinity has introduced modified 550 motors for the E-Maxx. Will they work in my Kyosho USA-1 monster truck, and if they will, which type of ESC should I use to run them, and do I need to use a 14V power source? I also saw that Trinity offers a 10-turn hand-wound modified motor, but I can't find it anywhere.
Debbie Whittaker
Orange, CT

Trinity originally planned to offer 19-, 16- and 10-turn modifieds, but after seeing how crazy fast and powerful these motors are, the company decided to offer more manageable winds. Monster Maxx motors are now offered in 21 (part no. 9241), 19 (9242) and 17 (9243) turns.

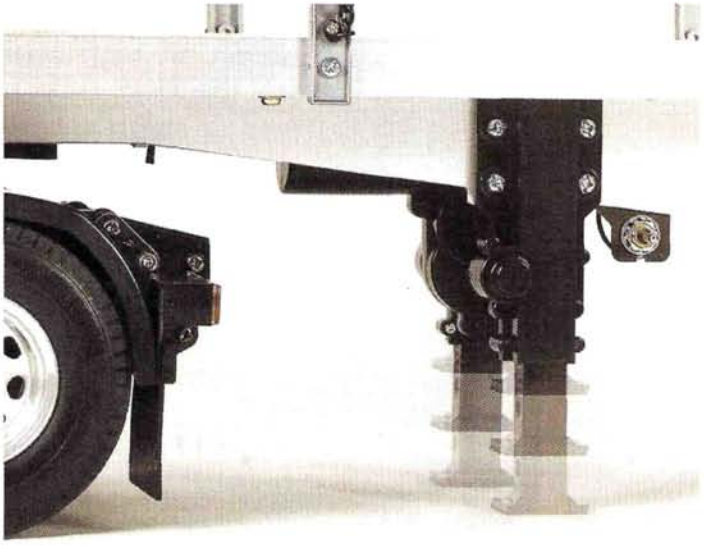
To fit the 550 motor in your truck, you need clearance at the brush end of the motor; the 550 is about ¼ inch longer than the 540, so if you don't have enough clearance for it, you will have to stick to a 540.

Start with a 17-turn single; if the 550 motor will fit, go for it! The 550 motors don't need 12 cells; they will run fine with only 6; 550 motors turn fewer rpm than 540s, but they produce a lot more torque because they have more wire wrapped around the armature. This means more rotating mass and that's why a 550 can't spin as fast as a 540. The extra wire gives the motor more torque because there is more metal to interact with the magnets. If you want to get more speed out of a 550 motor, you can gear the truck up or add more voltage to the system. Gearing up will tone down the yank of the motor and make your truck faster; giving the motor more voltage will give you more top speed and also more torque.

For a low-voltage application, I'd try 17T motors, but if you plan to power them with lots of voltage, try using the 19T motor.

You can use the same ESCs as you would use for modified 540 motors. Just be sure that the ESC you choose can handle the voltage you want to use; also check to ensure that your motor winds aren't too much for your ESC.

If you have any problems or questions about trucks, or if there is something you would like to see in "4x4," email me at kevinh@airage.com or send your letters to:
"4x4"
RC Car Action
100 East Ridge
Ridgefield, CT 06877-4606 USA



The trailer's support legs are controlled by the radio. The switch to the right allows you to control them manually.

Now, with this motorized leg-support kit, you can move the support legs up or down by RC. A small gearbox and a motor raise and lower the legs, which are spring-loaded to prevent the drive train from stripping when the legs are fully extended or completely retracted.

There are two ways to raise or lower the legs:
1. A three-way switch allows you to control the legs by hand.
2. Two microswitches are mounted on the fifth wheel pin; one switch moves the legs up and the other moves them down. A new fifth wheel is also included in the kit. This—plus a servo—is installed on the truck's chassis. The servo controls the latch on the fifth wheel, and when the truck is backed into or attached to the trailer, it controls the two microswitches on the fifth wheel pin.

• Sound-effects set. Tamiya is known for producing very realistic scale vehicles, but this sound-effects kit just blew me away! It consists of a DDS control unit, a speaker and a sound-volume unit. The speaker is in a small plastic box with a piece of black screen covering the speaker opening. Mounting instructions are included for all Tamiya rigs, and if you want to avoid muffling the sound, you might have to cut holes in the body. You can mount the small sound-volume unit anywhere that's convenient; turn the speaker volume up or down from there.

The DDS unit is powered by the truck's running battery and controls seven sounds: engine starting, idling and running, braking, horn, reverse-warning beeper and engine stopping. ■

TRICK STUFF TRUCK

RPM T-Maxx/E-Maxx bulkhead braces

You can add color and protection to your T-Maxx or E-Maxx with these new bulkhead braces from RPM. The rear brace is the same size as the stock piece while the front extends toward the ground to help keep dirt out of the front differential area. They are offered in black, blue and purple, and mounting screws are included.
T-Maxx/E-Maxx Bulkhead Braces (black/neon blue/purple)—80152/80155/80158.
$8.95/each

SOURCE GUIDE

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FUTABA
distributed exclusively by Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826; www.futaba-rc.com.

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TAMIYA AMERICA INC.
2 Orion, Aliso Viejo, CA 92656-4200; (800) TAMIYA-A; fax (949) 362-2250; www.tamiya.com.

RPM R/C PRODUCTS
14978 Sierra Bonita Ln., Chino, CA 91710; (909) 393-0366; fax (909) 393-0465; www.rpmrcproducts.com.

Tamiya **TG10 and TB-01 Long Suspension Arm Set**

If you've checked out the spec charts in our vehicle reviews and shootouts, you've probably noticed that Tamiya's TG10 and TB-01 chassis are closer to 180mm than to the class-maximum width of 190mm. Wider is better, and these chassis have been limited by the missing millimeters. Tamiya now has a fix and offers a kit to fatten up both chassis. The TG10 and TB-01 Long Suspension Arm Set includes all the parts and hardware necessary to make the conversion.

After emptying the contents of the box on my desk, I immediately noticed that all of the parts were borrowed from various existing cars. The hubs, uprights and wheel axles were borrowed from the Tamiya TGR. These parts as well as the arms, steering knuckles and axles can also be found on Tamiya's new TB Evolution racecar.

The arms, steering knuckles, hubs and uprights are all extremely rigid one-piece units and have a semi-gloss, composite-plastic look that is very attractive to the diehard racer. Steel dogbones are supplied along with new wheel axles to accommodate the new width. The wheel axles are splined and mate to the aluminum splined wheel-hexes. Bronze bushings in the knuckles and hubs support the wheel axles. In an upgrade kit, I'd much rather have ball bearings than bushings, but they do get you on the road without an extra purchase. Steel E-clip-retained hinge pins are included as well as tie rods for the upper links and steering. Miscellaneous screws, nuts, collars and ball studs are supplied to complete the long-arm transformation. Also included with the kit is a well-detailed instruction sheet to show you step by step how to convert the suspension.

INSTALLING AND TESTING THE CONVERSION

I performed the surgery on a stock TG-10. It was a simple process of removing and replacing parts and could even be done easily without the instructions. After removing the old two-piece arms, I placed them up against the new arms for comparison. The hinge points are significantly farther out on the new arms, which should translate to better cornering and handling on the track. New tie rods compensate for the extended length; however, shorter tie rods are necessary to link up to the new steering knuckles. The links are supplied, but you'll have to cut the ball ends shorter. Carefully cut them with a sharp hobby knife.

Before the transformation, the TG10 measured a narrow 178mm, and after the conversion, it measured a healthy 188mm. For TB-01 owners, the conversion sizes the car up to the legal width for electric TC racing. Though not the maximum width of 200mm that most other nitro-powered sedans have, it's still a big improvement and enough to make the TG10 more sure-footed on the track. The car felt much more stable than with the previous suspension setup. I was able to enter the corners with more speed and without worrying about the car washing out. The bumpy asphalt at the end of the straightaway didn't disturb the car as it had done prior to the conversion. When the test was over, I had shaved a couple of seconds off my fastest lap time.

Likes

- Rigid one-piece suspension arms.
- Brings the TB-01 up to max width.
- Steel hinge pins.

Dislikes

- Doesn't bring the TG10 up to 200mm.
- Bronze bushings are supplied for the hubs instead of bearings; if you're racer enough to want the conversion kit, you'll want the bearings.

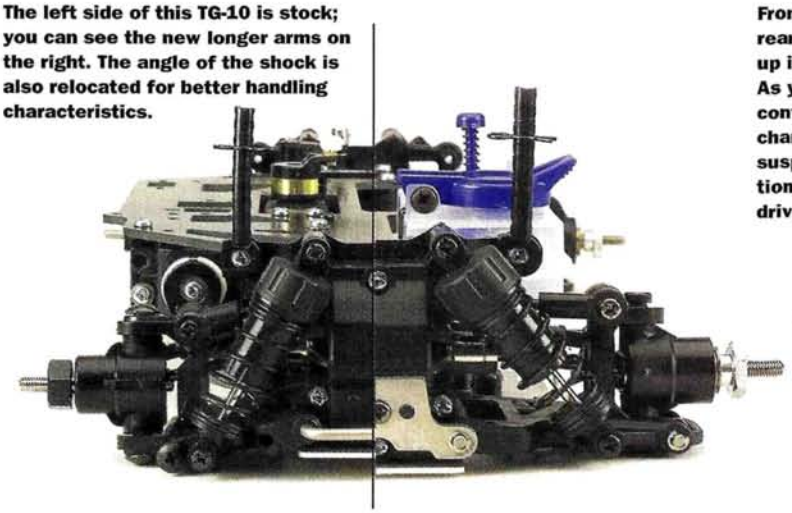
The kit contains everything you need for the suspension conversion and even includes new hardware.

THE VERDICT

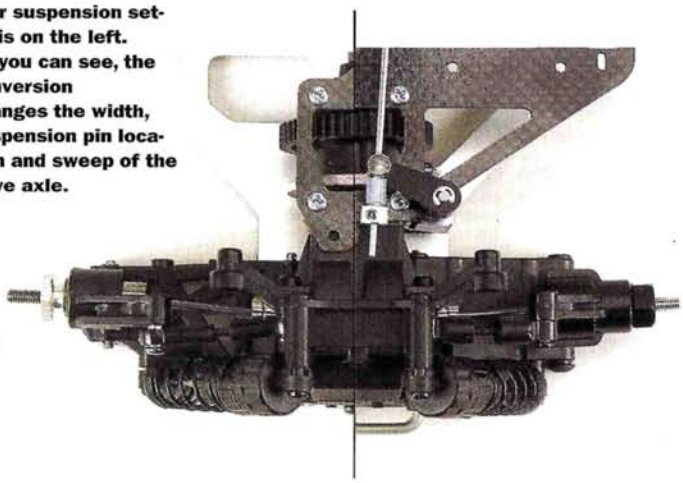
Tamiya's long-arm suspension conversion is a definite improvement over the TB-01 and TG10 stock narrow suspension. The parts are rigid and should hold up to some serious abuse. If you want better handling and cornering, this kit has everything you need at an affordable price.

Part no.—53430.
Price—$62.99.

The left side of this TG-10 is stock; you can see the new longer arms on the right. The angle of the shock is also relocated for better handling characteristics.



From above, the new rear suspension setup is on the left. As you can see, the conversion changes the width, suspension pin location and sweep of the drive axle.



Keyence
Zero-V Extreme EXC

Keyence made a name for itself in the RC car market with tiny ESCs, and its latest, the Zero-V Extreme, is another miniature marvel. But this time around, Keyence has built in more software features than in any of the A-01-series ESCs, and the Zero-V Extreme (ZVE) appears to be both highly adjustable and easy to use. I installed one in an XRAY T1 (featured elsewhere in this issue) to see what it had to offer.

FEATURES

• **MPRS cooling.** The initials stand for "metal plate radiation (of heat) structure"—a rather unwieldy name for what is essentially a large internal heat sink underneath the ZVE's faceplate. For additional cooling, the faceplate can be removed to expose the MRPS, and a stick-on, finned-aluminum supplemental heat sink (included) can be installed.

• **Advanced Gate Control System (ACGS).** According to Keyence, the AGCS eliminates the need for a Schottky diode, increases run time and reduces FET heating by "dynamically controlling FET gates according to motor speed."

• **User-programmable software.** The following ZVE performance parameters can be adjusted by means of controls built into the ESC: neutral point; deadband; minimum throttle; minimum brake; drag brake; drive frequency; brake frequency; drag-brake frequency; and current-limiter setting. The various frequency values all have a range of 100 to 20,000Hz and are set in 100Hz increments, although Keyence suggests you keep the frequency set below 15,000Hz when using modified motors because the super-high-frequency settings increase ESC heating. After setting the various parameters, you can save up to four custom "files" as data in the ESC and recall them later if you try new settings and wish to return to your original setup. Keyence has also built in three programs ("High Torque," "Standard" and "Smooth").

• **Graphic display.** An LED bar graph lights up to show which function has been selected and also its setting.

• **6V, 3A voltage regulator.** That's plenty of power for high-torque/high-speed servos.

An LED screen spells out the value for the function you select, and the three keys on the side of the Zero-V are used to access the functions. Compare the size of the ESC to the 2400 cell behind it—tiny.

Likes

- Programmable everything.
- Does not require additional equipment to alter programming.

Dislikes

- Power wires are not replaceable, and those colors ...!

MANUFACTURER'S SPECIFICATIONS

Input voltage	7.2 (6 cells)
On resistance	0.00034 ohm (FET)
Frequency	100 to 20,000Hz
Motor limit	none
Dimensions	37.4x27.5x18mm
Weight	29.6g w/out wires
BEC output	6 volts, 3 amps

• **Temperature and voltage indicator.** The ZVE's display will tell you the pack's voltage and the ZVE's internal temperature.

• **Timer mode.** The ZVE has a timer that measures the elapsed time from switch-on to a user-determined voltage cutoff—perfect for measuring run time.

• **Dash power mode.** Like earlier Keyence ESCs, the ZVE can be set to bypass the current-limiter setting for the first application of throttle, then it's reactivated as soon as the throttle returns to neutral or brake is applied.

• **Gold-plated battery and motor connectors**—nice touch, but will anyone buy this ESC to use with Tamiya plugs and bullet connectors? If you do, you'll be getting the best versions available, but they still won't perform as well as no-loss connectors from Deans, PowerPole, or

Continued on page 222

Panther Products Inc.
Meat Grinder tires for E- and T-Maxx

Until now, only chevron-pattern tires were available for the Traxxas E- and T-Maxx, and those seeking more hard-surface bite had to modify other tires. Enter Panther's medium-soft-compound Meat Grinders—one of five types it offers for Traxxas monsters. Their aggressive spike pattern is meant for off-road use only. They have the same diameter as stock treads and are a direct fit on Traxxas rims. They include a set of very firm, strip-type foams and offer very good bite in virtually all conditions. Part no.—PT950; $29/pair.

Dynamite
Fast Fill fuel bottle

The Fast Fill flexible nitro bottle holds 250cc (8.45 ounces), it has graduated markings to help you keep track of your fuel use, and its 5.25-inch-long red-anodized filler neck is angled to facilitate pouring. The well-sealed cap keeps your fuel fresh and prevents it from spilling. Part no.—DYN2004; $6.95.

Continued from page 220

AstroFlight, and most racers will skip connectors altogether and hard-wire instead. The ZVE is set up as a four-wire ESC, but since the positive motor and battery leads hook up to the same lug, you can use a three-wire hookup. (Note: it may look tempting, but don't replace the power wires at the circuit board; the wires actual bridge two boards, and there's some other circuitry going on in there from the look of it. The standard hot pink, lime green and mango wires may look funky, but leave them on there!)

OPERATION

Instead of a single setup button, the ZVE has a tiny keypad with three buttons: left arrow, right arrow and a center key. Simultaneously depress the arrow keys to activate the push-button setup sequence; when "set" is displayed, you input neutral when the ZVE prompts you with "nutr," full throttle when "drHP" is displayed (drive, high point) and full brake at the "brHP" prompt (brake, high point). From there, use the buttons to scroll through and select the various settings. Change the settings at the transmitter; pulling the throttle increases a value; pushing the brake decreases it. The shorthand displayed on the ZVE's LED display can seem strange at first, but it's easy to decipher. A manual written in English would have helped; I had Japanese instructions with a plain-paper translation. From the look of the well-illustrated Japanese manual, the ZVE's instructions should be first-class when coupled with English text.

DOES IT WORK?

I'm pleased to report that all the functions do what they're supposed to, although I can't say I would use all of them; I've never been one for current limiters and "dash" modes, but I found it useful to dial in drag brake and alter the neutral deadband; and you can dramatically alter the throttle's punch by cranking the drive frequency up (smoother feel) and down (more punch). You can make setup as complicated as you like, but once you've finished dialing, the ZVE operates like any other ESC: turn it on and go race; turn it off and forget about it. I stuck with conservative frequency settings in the 1000 to 10,000Hz range, and the ZVE stayed as cool as other competition ESCs I've used. In all, I'm impressed by the Zero-V Extreme; it's fully programmable without extra hardware, reliable (so far) and does what Keyence says it can do. ■

DuraTrax
Air Filter Oil

DuraTrax's Air Filter Oil is simple to apply to your filter's foam element, and it offers additional protection in dusty environments. It's hard to test this stuff very scientifically, but when you see how much dirt washes out of the filter when you've used the oil and compare it with how much dirt the filter trapped without it, you'll know it's working. The oil is inexpensive insurance against premature engine wear and provides peace of mind, too. Part no—DTXC2465; $5.95.

AstroFlight Inc.
Zero-Loss connectors

Racers will be the first to tell you that lowering resistance is the key to getting the best performance from an electric motor. Zero-Loss connectors are designed for 13- and 14-gauge wires. According to AstroFlight, they have the same resistance as an equal length of 13-gauge wire and therefore do not add any resistance to the circuit. The plastic plug housing is polarized to prevent accidentally reversing hookup, and complete soldering and assembly instructions are included. AstroFlight uses solid pins and a basket-shaped copper receptacle so the connectors are easy to disconnect but remain snug while in use.
Part no.—525; $8/pair.

SOURCE GUIDE

ASTROFLIGHT INC.
13311 Beach Ave., Marina del Rey, CA 90292; (310) 821-6242.

DURATRAX
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DYNAMITE
4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511; fax (217) 352-0355; www.horizonhobby.com.

GREAT PLANES MODEL DISTRIBUTORS
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KEYENCE CORP.
Higashinakajima, Higashiyodogawaku, Osaka, Japan 533-8555; 6-6325-6665; fax 6-6379-1190; www.keyence.co.jp.

PANTHER PRODUCTS INC.
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Lagoon Park R/C Raceway, 2730 Lagoon Park Dr., Montgomery, Alabama 36109; Alex Love, (334) 272-6438

Phenix Raceway & Hobby, 2006 Opelik Rd., Phenix City, Alabama 36867; Chris Watson, (334) 298-9786; web: www.xoom.com/PhenixHobby

R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, Alabama 35811; Rick Chambers, (205) 539-1347

R/C Thunder Tracks, 1530 Schillinger Rd., Mobile, Alabama 36675; Jerry Hurst, (334) 645-2787

Montgomeryís Field of Dreams, 5924 Ralston Way, Montgomery, Alabama 36116; Mike Westendorf, (334) 281-9432; email: mike_westendorf@yahoo.com

ALASKA

Fairbanks R/C Car Club, 510 Juneau Ave., Fairbanks, Alaska 99701; Dan Anderson, (907) 456-5494

ARIZONA

HobbyTown Raceway, 1102 E. 22nd St., Tuscon, Arizona 85704, (520) 882-8888

HobbyTown U.S.A., 5030 E. Ray Rd, Phoenix, Arizona 85044; Linda McFarland, (602) 598-5282

Kiwanis Park R/C Raceway, 855 S. Magnolia Ave., Yuma, Arizona 85364; Jim Liggett, (520) 539-7148

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, Arizona 85017; Brian Dick, (602) 278-3671

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, Arizona 85251; Scott Anfinson, (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Ste.8, Flagstaff, Arizona 86004; Gary McAllisteer, (520) 714-1566

ARKANSAS

Airport Speedway, 1521 Airport Loop, Rogers, Arkansas 72756; Mike Dollar, (501) 636-7123

Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, Arkansas 72901; Bryon Shumate, (501) 648-1994

Hobby Town USA, 356 E Joyce, Fayetteville, Arkansas 72703; Darrell Irvin, (501) 571-3730

Sparks R.C. Raceway, 7194 Greene 721 Rd., Paragould, Arkansas 72450; Tommy Sparks, (501) 239-3606

CALIFORNIA

Castle Hobbies, 14918 Camden Ave., San Jose, California 95124, (408) 377-3771

Hobby Central II Raceway, 13461 Community Road, Poway, California 92064; John, (619) 513-0373

Hot Rod Hobbies, 25845 San Fernando Rd., #21, Saugus, California 91350; Rod Weisbaum, (805) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd. #21, Rohnert Park, California 94928; Jake, (707) 586-3375

Just for Fun R/C Raceway, 509 S.State St, Ukiah, California 95482; Don, (707) 462-7305

M n M Hobbies, 4225 Prado Rd., Ste. 103, Corona, California 91720; Joe Stanovich, (909) 272-3545

Racer's Haven Raceway, 7401 White Lane #12, Bakersfield, California 93309; Martin Buchannan, (805) 835-0441

Rams 1/8-scale Gas and 1/10 scale Gas On-Road, Mission College, Lot B, 3000 Mission College Blvd., Santa Clara, California 95054-1897; Steve Tsuruda, (415) 675-5609

Ripon R/C Speedway, 701 N. Acacia Ave., Rippon, California 95366; Dan Tanis, (209) 599-5160

So Cal R/C Raceway, 19118 Brookhurst St., Huntington Beach, California 92646; Jim or Lana, 1-714-963-7484; email: info@socalrc.com; web: www.socalrc.com

Simi Valley Groundpounders, 392 C - East Easy St., Simi Valley, California 93065; Jack Kasten, (805) 584-8211

Ultimate Hobbies, 2378 North Orange Mall, Orange, California 92865; Cliff Murukami, (714) 921-0424

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Desert Hobbies, 28-401 Date Palm Dr., Cathedral City, California 92234; Mike Beall, (760) 320-9442

Capital City R/C Center, 8950 Osage Avenue, Sacramento, California 95829; Amer, 916-383-3445; email: lanno@pacbell.net

The Dirt Valley R/C Racepark, 146 So. Santa Fe St., Hemet, California 92544; Joe Christenson, (909) 925-7592

Gooch Raceway & Hobbies, 115C N. Chevy Chase Dr., Glendale, California 91206; Devin Last, (818) 562-2380, fax (818) 242-0825

Speedworld Raceway, 90 Corporation Yard Rd., Roseville, California 95678; Tracy & Billy Bowerman, 916-783-8864; email: SPEEDDOG@mindsync.com; web: speedworld.rcracing.com

Paradise Hobbies, 491 Pearson Rd., Paradise, California 95969; David Lafabregue, (530) 877-6447; email: paradisehobbies@aol.com

Rattlesnake Raceway, 16470 Benson Rd., Cottonwood, California 96022; Mel Fisher, (530) 347-7215

COLORADO

MHOR R/C Raceway, 15540 E. Batavia Drive, Aurora, Colorado 80012; Jess A. Brockman, (303)343-0151; email: MHORRC@aol.com; web: members.aol.com/MHORRC/MHOR1.HTML

Valley West OffRoad Club, 447 30 1/4 Rd., Grand Junction, Colorado 81504; Mike Main, (970) 323-6124

CONNECTICUT

East Lyme R/C Kar Klub, Society Rd., East Lyme, Connecticut 06333; Howard Estorm, (203) 483-9201

K/N R/C Speedway Inc., West St., Stafford Springs, Connecticut 06076, (860) 684-9896

Racing and Entertainment Center, 29 Olcott St., Manchester, Connecticut 06040; Peter Tierinni, (860) 643-4768

R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, Connecticut 06082; Christopher Marcy, (860) 741-6501; email: cmarcy@rcmadness.com; web: www.rcmadness.com

Xtreme Radio Control, 469 Danbury Rd., New Milford, Connecticut 06776; Paul or Pete, (860) 354-4703

DELAWARE

The Hobby Outlet: Tracks of the Outlet, Salisbury Rd., Dover, Delaware 19901; Steve, (302) 697-8350

Hobby Stop Speedway, RD4, Box 100, Rte. 13, Seaford, Delaware 19973; Remy Haynes, Jr., (302) 629-3944

FLORIDA

South Daytona R/C Raceway, 2121 S. Ridgewood Ave., South Daytona, Florida 32119; Mike Bean, (904) 426-6481

South Palm Beach Racers, South County Regional Park, West Boca Raton, Florida 33486; Mike Fazio, (561) 338-5367

Kissimmee R/C Auto Racing, Model Craft World, Osceola Square Mall, 3831 West Vine St., Suite 60, Kissimmee, Florida 34741; John Rosser, (407) 944-4913; email: john@craftworldflorida.com; web: www.craftworldflorida.com

Means R/C Raceway, 150 Pondell Rd., North Fort Myers, Florida 33903; Pete Gonzalez, (941) 772-2251; email: jaimewootton@worldatt.net; web: members.xoom.com/wootj

Randy's RC Raceway, 7744 Glenwood St., Clermont, Florida 34711; Randy Zimmer, (352) 242-0557

Broward County R/C Race Club, Mills Pond Park, Ft. Lauderdale, Florida; Ed Decembero, (954) 525-3304

Burton's R/C Raceway, 4215 Mustang Rd., Lakeland, Florida 33803; Louie Burton, (941) 665-1322

Coral Springs Roadrunners, P.O. Box 9632, Coral Springs, Florida 33075; John Argentino, (954) 925-8284

Farmer's Hobby Shop & Raceway, 5006-3 E. Broadway, Tampa, Florida 33619; Greg Cardone, (813) 248-3314

First Coast Speedway, 6410 Waltho Dr., Jacksonville, Florida 32211; Bob Thompson, (904) 743-2161

Frontier Race Track, 15260 N.E. 244th Ave., Salt Springs, Florida 32134; Harold Reel, (352) 685-2881

G & C Hobby Raceway, 1228 Hypoluxo Rd., Lantana, Florida 33462; George, 561-547-3812; email: gnchobbies@quickbyte.net; web: www.gnchobbies.com

Greater Orlando Auto Racers, 970 Keller Rd., Altamonte Springs, Florida 32714; Rob Michael, (407) 834-9299

Hobby World Raceway, 7273 103rd St., Jacksonville, Florida 32210; Greg, (904) 772-9022

Monster Hobbies, 616 Southeast 10th St., Deerfield Beach, Florida 23441, (954) 428-9118

Morris Kohl's Raceway and Hobby Shop, 1202 W. Waters Ave., Tampa, Florida 33604; Morris Kohl, (813) 931-1626

My Rose, 1695 W. Indiantown Rd., Jupiter, Florida 33458; Mark Watson, (561) 744-3800

NORRA, 3300 Santa Barbara Blvd. (Golden Gate Community Park), Naples, Florida 34104; Dan Rodriguez, (941) 352-9021

Paradise Speedway, Mile Marker 98.5 U.S. 1, P.O. Box 738, Key Largo, Florida 33037; Joe Ravard, (305) 451-3707

PBG R/C Motor Park, 6351 Barbara St, Palm Beach Gardens, Florida 33418; Doug Gleason, (561) 743-9791

River City R/C Car Club, 9711 Sharing Cross Dr., Jacksonville, Florida 32257; Bill Fraden, (904) 268-1948

Ocala Radio Controlled Car Club, PO Box 70166, 2612 NE 24th Street. Ocala, Florida 34470; Bill Hamilton, Bonita Hansley, (352) 369-1895; email: staff@ORCCC.org; web: www.ORCCC.org

Superior Hobbie, 1478 Semoran Blvd., Casselberry, Florida 32707; Rob Michael, (407) 834-9299; email: racing@superiorhobbies.com; web: www.superiorhobbies.com

B&T RC Central, 811 Playground Rd., Fort Walton Beach, Florida 32547; Ryan Williamson, (850)863-1666; email: raw072783@aol.com

GB's Hobbies, 6839 S US Highway 1, Port St. Lucie, Florida 34953, (561)460-2844

Sand Dollar Speedway, 1900 S. Hwy 87, Suite I, Navarre, Florida 32566; Jim or Bev Patterson, (850) 939-8788; email: sanddollarspedwy@aol.com; web: members.aol.com/sanddollarspedwy/index.html

GEORGIA

Anthony's Victory Lane, 129 East Hwy 80, Pooler, Georgia 31322; Anna Stephens, (912) 748-0847

Echeconnee Superspeedway, 2149 Richardson Dr., Macon, Georgia 31206; Andy Thompson or Cliff Kline, (912) 788-8731

Sandy Cross Speedway, Rt. 1, Box 1071, Hwy. 51, Royston, Georgia 30662; Morris Phillips or Wayne Fowler, (706) 245-9573

KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Auto lap counting
- Food available

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Sugar Bowl R/C Speedway, 5272 Nelson Brogdon Blvd., Sugar Hill, Georgia 30518; Shelley Bailey, (770) 945-6709

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The Flight Box Hobby Shop, 3134-C Rockmart Rd., S.E., Rome, Georgia 30161-6826; Leslie Duke, (706)-234-3014

Hobby Town Raceway, 2301 Airport Thruway, Columbus, Georgia 31904; Frank Bastos, (706) 660-1793

Phil Hurd Raceway, 15 W. York Ln., Savannah, Georgia 31401; J. Filipow, (912) 232-9985; email: jfilipow@scad.edu; web: www.score-racing.org

Dalton Raceway and Hobby, 3036 Parquet Road, Dalton, Georgia 30720; Keith Manton, 706-226-6699; email: keithm@dalton.net; web: www.daltonraceway.com

Augusta R/C Racer's Club, 3628 Crawfordville Dr., Augusta, Georgia 30909; Darren, (706) 364-5608

Primetime Raceway, 432 S. Wall St., Calhoun, Georgia 30701; Tommy Jackson, 706-625-9037; email: PRIMETIMEHOBBY@GCCINTERNET.NET; web: PRIMETIMEHOBBY@GCCINTERNET.NET

HAWAII

Kakaako Water Front Park Dragway, 98-029 Hekaha St. Bay #32, Alea, Hawaii 96701; James Inkyo, (808) 487-5155

Maui R/C Racing Association, 230 Hana Hwy, Unit 11, Kahului, Hawaii 96732; Garret or John, (808) 873-0376, (808) 893-0116 or (888) 646-6687

Pearl City Raceway, 98-029 Hekaha St., Bay 32, Aiea, Hawaii 96701; James Inkyo, (808) 487-5155

Radio Control Hawaii, 474 Kalanikoa St., S-104, Hilo, Hawaii 96720; Glenn Shiroma, (808) 935-5629

Team PRC Racing Club, 176 Mamo St., Hilo, Hawaii 96720; Charlie Kawamoto, (808) 935-3561

Garden Isle R/C Racers, 5855 Ahakea St., Kapaa Kauai, Hawaii 96746; Arnold Morales, (808) 823-0856

IDAHO

Capital Dirt Burners, 1614 S. Latah, Boise, Idaho 83706; Jim Small, Mike Barr, (208)433-1631 or 378-1110

Dirt Stuff Plus, 5344 N. Yellowstone Hyw., Idaho Falls, Idaho 83401; Brian Krah, (208) 522-7576

Almosta Ranch Speedway, 1732 Eldridge Ave., Twin Falls, Idaho 83301; Casey Clements, (208) 733-8219

ILLINOIS

C.I.R.C.A., 905 Bibbs St., Jacksonville, Illinois 62650; Sport ën' Hobby, (217) 245-1375

C&R Hobbies, 39 E. Jones, Milford, Illinois 60953; Ray Craighead, (815) 889-4073

HobbyTown Raceway, 2103 N. Verterans Pkwy., Bloomington, Illinois 61701; Gary Pritts, (309) 664-4451

Leisure Hours R/C Raceway, 2712 Plainfield Rd., Joliet, Illinois 60435; Scott Hill, (815) 439-1777 (track) or (815) 439-1477 (shop)

Machesney Park, 1220 Shappert Dr, Machesney Park, Illinois 61115, (815) 282-1311

Marty's R/C Hobby, 1335 E. Broadway, Bradley, Illinois 60915; Gail or Marty, (815) 933-8441

Quad Cities Radio Raceway, 541 1st Ave. North, Silvas, Illinois 61282; Tom Bedwell, (309) 751-9663

Adam's R/C Raceway, 7201 S. Adams, Bartonville, Illinois 61607; Ray Tigue, (309) 633-9300

AJ's Raceway & Hobby, 10211 Keslinger Road, Dekalb, Illinois 60115; A.J. Schultz, (815) 756-2772

Monee R/C Raceway, 26049 Ridgeland Ave., Monee, Illinois 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597 (office)

Pontoon Raceway, 3670 St., Rte. 111, Granite City, Illinois 62040-4304; Pat or Skip, (618) 931-1206

Outlaw R/C Speedway, 1614 Broadway, Mattoon, Illinois 61938, (217) 234-6229

Radio-Active Raceway, 751 N. Bolingbrook Dr., #15, Bolingbrook, Illinois 60440; Jim, (630) 759-7557

Rector's R/C Raceway, RR 3, Box 104, Albion, Illinois 62806; Tim Wolfe, (618) 842-9379 (M-F), (618) 446-3282 (Sun.)

Shiloh Eagles Superspeedway, 308 N. Virginia Ave., Belleville, Illinois 62220, (618) 277-6030

Stanton Hobby Shop, 4718 N. Milwaukee, Chicago, Illinois 60630; Kevin Kane, (773) 283-6446

Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, Illinois 61016; Dean or Debbie, (815) 332-4516 or (815) 547-5984

Wep Speedway, RR #2, Box 44, Lawrenceville, Illinois; Bill Poe

Depot Hobby Raceway, 180 S. Seminary St., Galesburg, Illinois 61401; Rob Black, (309) 342-9323

Triangle RC Racing, 1870 CR1600N, Urbana, Illinois 61803, (217) 469-0121

H & H Hobbies and Raceway, 9346 Virginia Rd., Lake in the Hills, Illinois 60102; Mike Hollingsworth, (847) 458-1777

INDIANA

GM Raceway, 1651 W. Franklin St., Elkhart, Indiana 46516; Pete Russell, Pete Russell

Hardesty R/C Raceway, 11 East Plymouth St, Hamlet, Indiana 4653; Max Hardesty, (219) 867-8600

Hobby Barn Raceway, 1950 Springhill, Terre Haute, Indiana 47802-9694, (812) 299-5773

Hobbytown U.S.A., 5385 E. 82nd St., Indianapolis, Indiana 46250; Bill Scott, (317) 845-4106

P&T Hobbies and Raceway, RR 2 (Hwy. 60), Mitchell, Indiana 47446; Paul Weber or Tom Logsdon, (812) 849-6666; email: pnthobby@bigfoot.com

Race Street Hobbies, 1126 1/2 Race St., New Castle, Indiana 47362; Jim Burke, (765) 521-4888

RC Barn, 310 N 125 W, Monroe, Indiana 46772; Mark Lengerich, (219) 692-6600

Bremen Racing Ent., 308 N. Bowen, Bremen, Indiana 46506; Dale Heuberger, (219) 546-3807

R/C World of Indiana, 2246 West U.S. Hwy. 36, Lynn, Indiana 47355; Joe Kolp, (765) 874-2464; email: rcworld@global-site.net; web: www.RCWORLD.com

R/C Mania, 8 Wood Ct., Hebron, Indiana 46341; Ron Trobaugh, (219) 996-6288 (shop); (219) 762-5365

The Rink, 7900 Whitcomb, Merrillville, Indiana 46410; Don Reiner, (219) 769-8113

Showtime Lot Racing, 606 Lower Huntington Road, Fort Wayne, Indiana 46819; Mike Romines, (219) 478-6099

IOWA

Hobby Haven, 7672 Hickman Rd., Des Moines, Iowa 50322; Rick Marble, (515) 276-8785

IROAR Hawkey Downs Raceway, Hawkey Downs, 6th St. S.W., Cedar Rapids, Iowa 52404; Dave Kleinschrodt, (319) 556-8524

Manly R/C Club, P.O. Box 23, Manly, Iowa 50456; Bruce Hill, (641) 454-2025

Delb's Speedway, 423 11th Ave. So., Clinton, Iowa 52732; Rusti's Miniatures and Hobbies, (319) 243-2697

Mr. Car Raceway, P.O.Box 1112, Central Iowa Fairgrounds, Marshalltown, Iowa 50158; Jim Gossett, (515) 483-2234

Outback Speedway, 403 State St., Guthrie Center, Iowa 50115; Helens Enterprises, (515) 747-3064

Radio Control Raceway Park, 2100 First Ave. N., Fort Dodge, Iowa 50501; Bernie Halverson, (515) 576-3780

Riverside Raceway, Veteran's Park, Algona, Iowa 50511; Mike Beisch, (515) 295-9352

Wild Bill's Raceway, 901 W. Jones, Knoxville, Iowa 50138; William Anderson, Jr., (515) 842-5973

KANSAS

Hobbytown USA, 2016 W. 23rd, Lawrence, Kansas 66046; Kevin Decemberus, (913) 865-0883

Mike's R/C Hobbies, 121 SE 29th St., Unit #3, Topeka, Kansas 66605; Mike Barnard, (913) 266-5767

Ottawa Outlaw Raceway, 114 South Main, Ottawa, Kansas 66067; Tom Wilson, (913) 242-1450

R/C Superdome and T.Q. Pro Shop, 14 E. Avenue A, Hutchinson, Kansas 67501; Cody or Joe, (316) 665-6633

T.Q. Pro Shop, 14 E Ave. A, Hutchinson, Kansas 67501; Cody Jandrakovic, (316) 665-6633

Creeks Crossing Speedway, 2340 Military Rd., Baxter Springs, Kansas; Richard, (316) 856-5083

KENTUCKY

Pit Stop Hobbies, 106 A Street, Benton, Kentucky 42025; Robert Fitzgerald, (502) 527-8216

Trio Hobbies & R/C, 216 Redmar Plaza, Radcliff, Kentucky 40160; Maurice Johnson, (502) 351-7547

Dixon's R/C RaceWay, 1428 Lost Creek Road, Hazard, Kentucky 41701; Jeff Dixon, (606) 436-4820

LOUISIANA

Pontchartrain Hobby Shop, 3755 Pontchartrain Dr., Slidell, Louisiana 70458, (504) 649-1199

Baton Rouge Velodrome, 7122 Perkins Rd., Baton Rouge, Louisiana 70815; Weldon Sharon, (504) 665-5616

Gator R/C Raceway, 3691 Hwy 171, Moss Bluff, Louisiana 70612; Tony Diaz, 337-855-3206; email: keithsjac@aol.com; web: homepage.mac.com/kmaples/

MAINE

Clay Bowl R/C Hobbies, P.O. Box 61, Greene, Maine 04236; Pat Cap, (207) 946-5003

R/C Speedway & Hobbies, 87 Main St., Fairfield, Maine 04963; David Prescott, (207) 453-4588

MARYLAND

Doug's Raceway, 2935 Crain Hwy., Waldorf, Maryland 20601; Doug Moran, Jr., (301)843-6220

Outback R/C Race Club, Maiden Lane., Manchester, Maryland 21102; Randy or Bonnie Henry, (410) 374-2878

The Track, 16806 Oakmont Ave., Gaithersburg, Maryland 20877; Mimi Wong, (301) 417-9630; email: mimithetrack@yahoo.com; web: www.rctrack.com

Hobby Town USA, 8223-11 Elliot Rd., Easton, Maryland 21601; Bill Dyke, (410) 820-9308

J.R.'s Race Place, 2935 Crain Hwy., Waldorf, Maryland 20601; James Radford, (410) 947-2766

MASSACHUSETTS

Megadrome Raceway, Rt. 8 Curran Hwy, North Adams, Massachusetts 01247; Bob Blanchette, (413) 743-7223

Northboro Speedway, 168 Main St., Rte. 20, Northboro, Massachusetts 01532; Bob Trimble, (508) 393-8087

Big Boys Toys, 40 Father Davol Blvd., Fall River, Massachusetts 02721, (508) 677-9400

C&C Hobby & Raceway, 562 Russells Mills Rd., So. Dartmouth, Massachusetts 02748; Charlie, (508) 997-4131

Hi-Tech Hobbies, 1681 Broadway (Rt. 138), Raynham, Massachusetts; Ruben, (508) 880-5373

MICHIGAN

Great Lakes Racers Club, 3810 Lousma Drive, Grand Rapids, Michigan 49858; John Warner, 616-948-9798; email: Gr8LksRacers@aol.com; web: www.rogers 3.com/girc/

T.J.'s RC Raceway, Rt. 2, box 22C, Luther, Michigan 49656; Tod Smant, (616) 797-8035

Washtenaw R/C Raceway, TrackAddress, Ypsilanti, Michigan 48198, (734) 395-5048

N.M.R.C.C. Raceway, Hobby Toy, Main St.,, Gaylord, Michigan 49735; Ed Schneider, (517) 732-3963

Ovaitt's R/C Speedshop, 3920 N. US 31S., Traverse City, Michigan 49686; Jim Ovaitt, (616) 947-6670

Raw Roots Race Tracks, 14623 East Croswell1/4 mile north on 152nd (off U.S. 31), West Olive, Michigan 49460; Roy Bennink, (616) 399-9338

R&L Hobbies & Racing, 9782 Portage Rd., Kalamazoo, Michigan 49002; Rex Simpson, (616) 323-3686

Rodgers R/C Raceway, 7463 Ridge Rd., Britton, Michigan 49229; George Rodgers, (517) 451-8301

Thumb Raceway, 3441 Main St., Marlette, Michigan 48453; Jim Wilson, (517) 635-7848

Vicksburg Off-Road R/C Raceway, 50201 Silver St., Vicksburg, Michigan 49097; Tim, (616) 323-7963

Village Hobbies-n-Crafts, 195 N. Elm, Hesperia, Michigan 49421; Alan or Fran, (616) 854-1374

Village R/C Raceway, Prairie Ronde St., Decateur, Michigan 49045; Chuck Nolke, (616) 423-7878

Willis Outdoor R/C Racetrack, 13922 Oakville-Waltz Rd., Willis, Michigan 48191; Mike Higgins, (734) 587-2012

Hobby Hub, 5859 M99, Diamondale, Michigan 48821; Verne Goeble, (517) 337-9278 or (517) 351-5843

JT Superspeedway, W. Golden Ave., Battle Creek, Michigan 49105; Jerry or Sam, (616) 965-0116

Larry's Performance R/C's, 43665 Utica Rd., Sterling Heights, Michigan 48314; Larry, (810) 997-4840

Lazer RC Speedway, 2858 N. Wilmoth Hwy., Adrian, Michigan 49221; Russ Johnson, (517) 263-2806

R.A.C.E. Inc., 3227 Mathews, Jackson, Michigan 49203; Sam Sprang, (517) 787-9161

D.R. R/C, 22789 Northline Rd., Taylor, Michigan 48180; Bobby or Fred, (734) 287-7405

Freedom Hill R/C Raceway, 35372 Wellston, Sterling Heights, Michigan 48312; Jim McKenna, (810)268-3996

(810) 268-3996

Jons Hobby, 4739 E. Pickard Rd, Mt. Pleasant, Michigan 48858; Jon Beutler, (517)773-5412; email: jonshobby@voyager.net

MINNESOTA

Bemidji R/C, 1015 Miles Ave. S.E., Bemidji, Minnesota 56601; Russ or Ryan, (218) 751-1629

Southside Speedway, 2241 Marion Rd. SE, Rochester, Minnesota 55904; Kevin Guy, (507) 281-3233

Time R/C Raceway, 20 West Lake St., Chisholm, Minnesota 55719; RV, (218) 254-4321

Red Barn RC Raceway, Rt. 4 Box 333, Mankato, Minnesota 56001; Rusty Weiss, (507) 345-8972

Kevin's Private Off-Road Raceway, 702 So. Washington Ave., Crookston, Minnesota 56716-2317; Kevin Altepeter, (218) 281-7523; email: kevin@krcproducts.com; web: www.krcproducts.com

Granite City R/C Speedway, 3555 Shadowwood Dr. N.E., East Hwy 23, Sauk Rapids, Minnesota 56379; Brett Donahue, (320) 251-6980

J's Radio Control Race Park, 22994 290th Ave., Starbuck, Minnesota 56381; Jay Campbell, (320) 239-4827

Northwoods Hobby Raceway, 2638 Hwy 25 North, Brainerd, Minnesota 56401; Tom Grogg, (218) 829-9257

Ray's Raceway Park, 105 3rd Ave. NE, Glenwood, Minnesota 56334; Dan Winter,, (320) 634-5246

R/C Racing World, 235 Main Ave, North, Harmony, Minnesota 55939; Mark McKay, (507) 886-5931 or (507) 886-2224

Car Town USA, 2822 Piedmont Ave., Duluth, Minnesota 55811; Roger Deloach, (218) 727-6248

Duey's Hobbies & R/C Raceway, 6600 Cahill Ave., Inver Grove Heights, Minnesota 55076; Duey Carlson, (612) 450-1721

MISSISSIPPI

X-Treme RC, 18332 Amanda Lane, Saucier, Mississippi 39574; Marty Capers, (228) 539-2004

Joe McFaden Hobbies, 5531 Fox Meadow Dr., Meridian, Mississippi 39307; Joe McFaden, (601) 483-7000

Small Cars Unlimited, 820 Cooper Rd., Jackson, Mississippi 39212, (601) 372-FAST; web: www.smallcarsunlimited.com

MISSOURI

Greentree R/C Racepark, St. Louis Dirt Burners R/C Club, Marshall Rd., Kirkwood, Missouri, (314) 831-2194

North Missouri Raceway, 223 Graves St., Chillicothe, Missouri 64601; Billy Johnston, (660) 646-1120

Ozark Mountain Speedway, Rt. #2 Box 50, H-Highway and County Rd. 31, Noel, Missouri 64854; Clayton Younker, (417) 475-6222

Real Blue Vue Speedway, 12019 E. 47th St., Kansas City, Missouri 64133; Steve Hale, (816) 358-0238; email: hrealrc@aol.com; web: www.geocities.com/real_rc_raceway

Real R/C Raceway, 24204 State Rt. 58, Pleasant Hill, Missouri 64080; Steve Hale, (816) 540-5584; email: hrealrc@aol.com; web: www.geocities.com/real_rc_raceway

B&L Hobbies & Raceway, 2800 Anchor Dr., Park Hills, Missouri 63061; Bob Marler, (573) 431-9444

Ozarks R/C Raceway, 1923 E. Kearney, North Town Mall, Springfield, Missouri 65803; Gene Rhodes, 417-873-9350, 742-4376; email: OzarksRaceway@aol.com

MONTANA

Stormer Raceway & Slot Motorplex, P.O. Box 126 Hwy. 2 East, Glasgow, Montana 59230, (406) 228-4569

NEBRASKA

Hobbytown USA Raceway, N 1st St. & Cornhusker Hwy., Lincoln, Nebraska 68508; Ben Smith, (402) 434-5056

Mr. Bill's, 450 West 2nd St., Hastings, Nebraska 68901; Bill J. Ries, (402) 462-4865

O.N.R.O.A.D., 3307 N. 58 St., Omaha, Nebraska 68104; Cook Jacobs, (402) 556-8674

OTWG Carpet Raceway, 55129 849th Rd., Norfolk, Nebraska 68701; John Schoenauer, (402) 644-7922

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), Nebraska 68133; Marty Stepanek, (402) 593-6133

Salvation Army South Corps, 4032 Harrison St., Omaha, Nebraska 68164, (402) 734-3414

T & T Raceway, 476 26th Ave., Columbus, Nebraska 68601; Tom, (402) 564-9216

The Speed Zone, 1524 Atokad Dr., South Sioux City, Nebraska 68776; Rob Murdock, (712) 428-4679

Wacha's R.C. Speedway, 1823 23rd St, Columbus, Nebraska 68601; Tom Smith, (402) 564-9216

Goodyear Speedway and Off-Road, 4021 North 56th, Lincoln, Nebraska 68510; Tom or Bob, (402) 464-5172

Hadar R/C Raceway, 55192 849th Rd., Norfolk, Nebraska 68701; John Schoenauer, (402) 644-7922

NEVADA

Bill's Hobby Shop, 1000 N. Nellis Blvd., Las Vegas, Nevada 89110; Bill Schultz, (702) 531-3283; web: www.billshobbyshop.com

Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, Nevada; David Lugo, (702) 453-RACE or (888) 675-8963; web: www.danseys.com

Lizard Raceway, P.O. Box 1248, Verdi, Nevada 89439; Jeff Griffin, (702) 345-6573

NEW HAMPSHIRE

Axis Racing R/C Dragway, 4197 High St., Exeter, New Hampshire 03833; Dan Peterson, (603) 659-4877

Economy R/C Speedway, 4 Maple St., Winchester, New Hampshire 03470; Harold Thomas, (603) 239-4482 or 239-6470

Robert's Railroad & Hobbies, 1335 1st NH TurnpikeóRt.4, Northwood, New Hampshire 03261; Robert M. Jeffers, Jr., (603) 942-5193

RT 106 Racepark, 743 Clough Mill Rd., Pembroke, New Hampshire 03275; Fred Farwell, (603) 224-RACE

Lakes Region R/C Speedway, Lily Pond Rd., Gilford, New Hampshire 03246, (603) 524-2909, 524-2628

NEW JERSEY

Family Hobbies Raceway, 3576 N.W. Blvd. & Weymouth Rd., Vineland, New Jersey 08360; Linda Vogel, (609) 696-5790

Jackson R/C Racing, P.O. Box 565, Christopher Columbus Blvd., Jackson, New Jersey 08527; Al Sodano, (732) 364-6422

Jefferson Speedway, 5494 Berkshire Valley Rd., Oak Ridge, New Jersey 07438, (201) 697-7525

Jerry's Hobby Center & Raceway, 336 Rt. 22W, Greenbrook, New Jersey 08812; Jerry or Gary, (908) 752-6030

LBRA Track, 392 Warburton Pl., Long Branch, New Jersey 07740, (908) 222-5122

Millville R/C Oval, 114 N. High St., Millville, New Jersey 08332; William Denstoz, (609) 327-4640

On Trax Hobbies, 3101 Rte. 70, Browns Mills, New Jersey 08015; Joseph DiGirolamo, (609) 735-0422

American Raceway, 557 Englishtown Road, Englishtown, New Jersey 07726; Doug Venner, (732) 446-3737; email: DMC12@prodigy.net; web: www.americanraceway.com

South Jersey Cost Controlled Racing, 25 Jackson Lane, Sicklerville, New Jersey 08081; Ray Murray, (609) 629-4809

The Race Place, 1151 Hwy. 33, Farmingdale, New Jersey 07731; John Fary, (908) 938-5215

America's Hobby Center Inc., 8300 Tonnelle Ave, North Bergen, New Jersey 07047; John Many, (201) 662-0777

Checkerboard Raceways, P.O. Box 240, Elwood, New Jersey 08217; Ray Murray, (609) 629-4809

NEW MEXICO

Big Boys Toys Raceway, 1735 Juan Tabo, Albuquerque, New Mexico 87112, (505) 298-1023; web: www.bigboystoys.theshoppe.com

Las Cruces R/C Racer's Association, Meerscheidt Recreation Center, Walnut and Hadley by BMX, Las Cruces, New Mexico 88001; Robert Heinsen, Jim Meerscheidt, Robert -(505) 526-6856, Jim 527-4284; email: jade@zianet.com; web: www.zianet.com/jade/lcrcra.htm

NEW YORK

Frogtown Hobbies, Rt. 37, Mini Pines Village, Hogansburg, New York 13655; Dennis White, (518) 358-3686

Hacr's Hobbies & Raceways, 120 Cayuga St., Canal View Mall, Fulton, New York 13069; Jack LaTulip, (315) 598-7063

Jerry's Raceway, 111 S. Applegate Rd., Ithaca, New York 14850; Jerry and Lori Achilles, (607) 277-0940

LI 1/4-Scale Racers, 63 Horton Dr., Huntington Station, New York 11746, (516) 351-5384

Long Island Raceway, 168 Broad Hollow, Farmingdale, New York 11735; James, (516) 845-7223; web: www.raceway.com

Performance Plus Radio Control Speedway/ The Hobby House, 1141 1/2 Jones & Gifford Ave., Jamestown, New York 14701, (716) 488-1772

P.R.O. Speedway, 5 Washington St., Cattaragus, New York 14719; Marc Pritchard, (716) 257-3101

Radio Hill Raceway, 1219 Shannon Corners Rd., Dundee, New York 14837; Bill Brewer, (607) 243-8641

Rampage R/C & Hobbies, 782 Rt. 9G, Rockledge Plaza, Hyde Park, New York 12538; Brian Walker, or Kevin Bobb, (914) 229-1379

R/C Competition Corner, 2202 Brewerton Rd., Mattydale, New York 13211; Lori and Cos Ciririello, (315) 455-8718

Silver State R/C Club, Centennial Park, Carson City, New York 89501, (702) 853-3953

Southern Tier Raceway, 88 Paige St., Owego, New York 13827; Anita Harding, (607) 687-5395

South Shore Hobby & Raceway, 464 East Main St., Patchogue, New York 11772; Benny or Bonnie, (516) 758-5567

Tri County Remote Control Car Club, 33 West Decker St., Johnstown, New York 12095; Tom Leville, (518) 725-1279

TARMAC Ultimate R/C Raceways, 28-30 Mountain View Rd., Poughkeepsie, New York 12603; Todd, (845) 342-5409, tracksite (845) 454-8276; email: toddp@tarmacraceway.com; web: www.tarmacraceway.com

Walt's Hobby, 2 Dwight Park Dr., Syracuse, New York 13209, (315) 453-2291

Westfield R.C. Speedway, 27 Clark St., Westfield, New York 14787; John or Jared Lindstrom, (716) 326-2339; 716-326-2309

MTW Raceway, 11930 Johnny Cake Hill Rd., Cato, New York 13033; Tim Amie, (888) 39-HOBBY; (315) 626-2029; email: docsavage@mtwraceway.com; web: www.mtwraceway.com

BarnStormers Speedway, 205 Gray Court Rd., Chester, New York 10918; Lou, (914) 469-6468

Brownie's Pro & Sport Hobbies, 124 Bennett St, Staten Island, New York 10302-1426; John Brown, (718) 727-2194

Bruckner Racing, 2908 Bruckner Blvd., Bronx, New York 10465; Thomas Baffers Sr., (800)-288-8185

BSK Hobbies & Raceway, 120 Main St., Hornel, New York 14843; Bruce Harris, (607) 324-4011, (800) 603-0197

C&D Raceway, 12542 NYS Rte. 12E, Chaumont, New York 13622; Chris or Don Bourquin, (315) 649-5403

Capital District R/C Racers, 27 Venus Dr., Albany, New York 12211; Peter Willis, (518) 482-7128

Chipmunk Hill R/C Speedway, 217 Pine St., Theresa, New York 13691; Ted or Pete House, (315) 628-5065

East Coast R/C Hobbies, Floyd Bennet Field, Brooklyn, New York 11204; Brian Cardella, (718) 627-3814

Foothills R/C Speedway, 3200 Chestnut St., Oneonta, New York 13820; Dave Osterhoot, (607) 432-5098

B & S RC Speedway, 15661 Route 31, Albion, New York 14411; Dan, (716) 589-0621; email: bandsspeedway@go.to; web: www.go.to/bandsspeedway

Brennan's RC Hobbies, 6368 State Rt. 5, Vernon, New York; Bill or Tom Brennan, (315) 829-4930

Fastraks, Mini Pines Village, Hogansburg, New York 13655, (518) 358-3686

R.C. Raceway, 1961 Rt. 6, Carmel, New York 10512; Rich, (914) 228-0001

Competition Hobby, 1006 Loudon Rd., Cohoes, New York 12047; Howie Cummings, 518-786-3622; email: hic300@aol.com

NORTH CAROLINA

Atlantic Coast R.C., 8-A Lockhead Ct., Greensboro, North Carolina 27409; Charlie Higgins, Harry Johnson, 336-664-1277

Rosewood RC Speedway, 651 Community Dr., Goldsboro, North Carolina 27530; Glenn Elam, 919-731-4734

Youngsville R/C Club, 6516 NC 96 Hwy W., Youngsville, North Carolina 27596; James Ray, (919) 556-0446

Carolina Dragway, 115 Kerr St., Clinton, North Carolina 28328; Corbitt Marshburn, 910 592-9489; email: carolinadragway@aol.com

A&J R/C Models, 2051 Anthony Rd., Burlington, North Carolina 27215; Jerry Love or Andrea Thompson, (910) 227-4556

Ride & Slide R/C Raceway, 5319 Yadkin Rd., Fayetteville, North Carolina 28303; Bill Culbertson, (910) 867-4202

Radio Jockey's Parkway, "RJ's", Rt. 9 Box 651, Fayetteville, North Carolina 28301; Tony Starling, (910) 486-4820; web: www.wave-net.net/rnshutt

R.C.R. Speedway, 1415 Henderson Grove Church Rd., Salisbury, North Carolina 28147; Ronnie Linker, (704) 637-2565

Southern RC Motorsports Club, Hwy 17S., PO Box 1651, Shallotte, North Carolina 28459; Mark Whitt or Eddie Ferster, (910) 754-4902-Mark or (910) 754-8528-Eddie

NORTH DAKOTA

Northern Mini Racers, 1000 36th St. SE, Minot, North Dakota 58702; Mike, (701) 838-5818

River City R/C, 2714 Main Ave., Fargo, North Dakota 58103; Chris, (701) 235-1272

OHIO

R&R Speedway, 1258 W. Alexis, Toledo, Ohio, (734) 665-2849; email: rnr@rnr-speedway.iwarp.com; web: www.rnr-speedway.iwarp.com

American Ohio Sprint Car, 1708 Empire Rd., Wickliffe, Ohio 44092; Gary Waldhelm, (440) 944-9966

KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Auto lap counting
- Food available

Classic Hobbies, 1994 E. Waterloord, Akron, Ohio 44312; Walt Ellis, (330) 733-6400

CORCAR/ Sams Club, 128 Amity Rd., Galloway, Ohio 43119-8732; Bill Stevenson, (614) 870-7159

Columbus R/C Racing Club (C.R.C.R.C), Franklin County Fairgrounds, Hilliard, Ohio 43026; Jeff Crowell, (614) 236-1783

D&J R/C Raceway, 801 W. Market St., Orrville, Ohio 44667; Don Yoder or Mark Nussbaum, (330) 682-4266

Glass City Radio Control, 2620 Ivy Pl., Toledo, Ohio 43613; Frank Johnson, (419) 472-1286

Greentown R/C Raceway, 3353 Perrydale, Greentown, Ohio 44630; Chuck Lambert, (330) 364-6585

Hobby Shop Raceway, 2096 Miamiburg, Centerville, Ohio 45459; The Hobby Shop, (937) 436-6161

Hobby World, 3499 SR 59, Ravenna, Ohio 44266; Tom Fry, fax (330) 296-0894

Lafferty R/C Raceway, Box 153, 70228 Hurrah St., Lafferty, Ohio 43951; Chris Christman, (614) 968-4818

Mid American Raceway, 13150 Airport Hwy., Swanton, Ohio 43558; Bill or Chuck, (419) 475-9459

Nothing But Air R.C. Track, 34632 True Rd., Logan, Ohio 43138; Gary Lloyd, (740) 385-0288

TARCAR, 7216 Nebraska Ave., Toledo, Ohio 43617; Bill Bridges, (419) 826-3859

Van Wert R/C Raceway, 144 E. Main St. (above Hoverman Music), Van Wert, Ohio 45891; Mark Davis, (419) 232-2112

DeFosse Raceway, 7652 Gooselick Rd., Ripley, Ohio; Greg DeFosse, (937) 377-2063

J&L R/C Raceway, 5342 W. St. Rt. 718, Troy, Ohio 45373; Mike Wegman, (513) 521-3408; email: wegs@one.net

Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, Ohio 43701; Kevin McKenna, (674) 455-3025

AK Hobby & Raceway, 3826 North Bend, Cincinnati, Ohio 45211; Tim Tolle, (513) 661-7080

OKLAHOMA

Wild Country Speedway, 127 South Main, Porter, Oklahoma 74454; Charles McCollough, (918) 685-0372 or (918) 687-1686

Adams Creek R/C Speedway, 5207 S. 194th E. Ave., Arrow, Oklahoma 74014; John Beighle, (918) 355-1416

Competition R/C, 100 SE 89th, Oklahoma City, Oklahoma 73149; James or Louise Brown, (405) 634-0809

Enid R/C Speedway, 1831 S. Van Buren, Enid, Oklahoma 73703; Darin Pendleton or Fred Hollis, (580) 554-9400; email: darin@enid.com

R/C Speedway of Lawton, 202 Southeast B Ave., Lawton, Oklahoma 73501; Rick, (580) 355-8040

OREGON

Competition Racing Association, 17941 NE Gleason, Portland, Oregon 97230; Mark Taylor, (503) 761-1334

D.I.R.T. R.O.A.D., 65540 73rd St., Bend, Oregon 97701; Daleyne and Edward Glietz, (541) 388-2932 or 1-800-475-6040 then ext. 777; email: blue@coinet.com

R/C Plus Hobbies Raceway, 1685 25th St. SE, Salem, Oregon 97302; Ron Smith, (503) 364-9188; email: rcplus@rcplus.com; web: www.rcplus.com

R/C Speed Center, 2810 N. Pacific Hwy., Medford, Oregon 97501; Gene and Betty Jean Skelton, (541) 779-8298

Yamhill County R/C Car Club, 722 Morgan Ln., McMinnville, Oregon 97128; Larry Rucker, (503) 472-7234

Competition Racing Association, 17941 N.E. Gleason, Portland, Oregon 97230; Mark Taylor, (503) 761-1334

D.I.R.T. R.O.A.D. Club, 65540 73rd St., Bend, Oregon 97701; Daleyne & Edward Glietz, (541) 388-2932 or (800) 475-6040 ext.777; email: blue@coinet.com

Rose City Scale Racing, Highway 24 K-Mart Parking Lot, Milwaukie, Oregon 97222; Rick Strauss, (503) 631-2929

PENNSYLVANIA

Mad-O Hobby Raceway, 850 Freedom Crider Rd., Freedom, Pennsylvania 15042, (724) 774-0240; email: mado-hobby@forcomm.net

McCullough's Offroad, 108 Callen Rd., Sarver, Pennsylvania 16055; Doug McCullough, (724) 352-0116; email: DMcCull323@aol.com

Racers Edge R/C Racing, RR#1, Box 271, Smethport, Pennsylvania 16749; Rick Morgan or Johna Simar, (814) 887-2269; email: morg@penn.com; web: users.penn.com/~morg/track.html

Courtview Raceway, 20 S. Main Street (lower level), Washington, Pennsylvania 15301; Aaron Stimmell Jr., (724) 225-4302

DC Ultra Trax, 13 York Rd., Wycombe, Pennsylvania 18974; David Cowan, (215) 672-5200

Dreamboat Hobbies, 2810 Pennsylvania Ave. W., Warren, Pennsylvania 16365; Louie Dussia, (814) 723-8052

Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, Pennsylvania 15204, (412) 331-3866

Kranzel's R/C Raceway & Hobbies, 415-B Bosler Ave., Lemoyne, Pennsylvania 17043; David or Stuart Kranzel, (717) 737-7223

Little Plum R/C Hobbies, RR 1 Box 330, Lock Haven, Pennsylvania 17745; Larry Duck, (570) 769-1984

Lugnut Raceway, 1713 Bethlehem Pike, Hatfield, Pennsylvania 19440; Bill Henning or Kathy Anderson, (215) 822-5831

Marshall's R/C Raceway, RR 4, Box 640, Honesdale, Pennsylvania 18431; Bill or Dot Marshall, (570) 729-7458

Pinion Twisters, 3M Plant, Green Ln. and Mitchell, Bristol, Pennsylvania 19007; Mark or Tony, (215) 632-2344 or (215) 742-3560

Pit Stop Hobbies, 262 W. Main St., Mount Joy, Pennsylvania 17552, (717) 653-6222

Prop & Wheels Raceway, 139 W. Broad St., Tamaqua, Pennsylvania 18252; Gil Walters, (570) 668-2288

The Raceway at River Junction, 1216 4th St. (behind cemetery), Beaver, Pennsylvania 15009, (724) 728-5571

RC Ave. Raceway, 324 McKinley Ave, Latrobe, Pennsylvania 15650, (412) 537-5501

RC Outfitters RCO Raceway, 519 Broadway, Hanover, Pennsylvania 17331; Chris Shaffer, (717) 633-9490; web: rco.webjump.com

R/C Pro III, 910 Chestnut St., Shamokin, Pennsylvania 17866; John Swisher, (570) 648-7763

Riverside Raceway, PA Ave. W & Hickory, Warren, Pennsylvania 16365; Jeff, (814) 723-4211

S.A. Hi Banks, Hahn's Dairy Rd., Palmerton, Pennsylvania 18071; Scott Andrews, (610) 826-4583

Staub Bros. R/C Speedway, 31 Locust St., Gettysburg, Pennsylvania 17325; Todd or Scott Staub, (717) 334-5445

TnT Raceway, Randolph Rd., Great Bend, Pennsylvania 18821; Frenchie or Ed Kraft, (607) 775-1750 or (717) 967-2604

Trains & Lanes Raceway, 3825 Northwood Ave., Easton, Pennsylvania 18045; Jeff Setzer, (610) 253-8850 or (800) 447-4891

Willow Mill Speedway, 37 N. Season's Dr., Dillsburg, Pennsylvania 17019; George Verbowitz, (717) 432-4445

World A.T.L.A.S./P.A.R.C.E. R/C Raceway Hobby Shop & R/C Club, Chester Exchange Mall, 10th & Morten St., Chester, Pennsylvania 19013; Darryl, Lee or Marc, (610) 874-2540

B&B Raceway, 1301 Pine St., Berwick, Pennsylvania 18603; Ray Berry, Jr., (570) 759-3469

D&D Hobby Shop, 305 3rd St., Rouseville, Pennsylvania 16344, (814) 676-4475

The Mushroom Bowl, 960 W. Cypress St., Kennett Square, Pennsylvania 19348; Bruce or Drew, (610) 444-1850

The Raceway at River Junction, 1216 4th St. (behind cemetery), Beaver, Pennsylvania 15009, (724) 728-5571

Somerset Hobby Shop Outlet, 4309 Glades Pike, Somerset, Pennsylvania 15501; Bob Rhodes, (814) 445-6214

PUERTO RICO

Area 51 On Road Track, Carr 931 KM 1.5, Gurabo, Puerto Rico 00745, (787) 739-1572

Cidra R/C Track, Carr 7787 KM 1.6, Bo Beatriz Adentro, Cidra, Puerto Rico 00739; Humberto (Tito) Lizardi, (787) 739-1572

Dorado Offroad R/C Track, Pista Atletica Bo. Higuillar, Dorado, Puerto Rico 00646; Roberto Lamoso/Jaime Ramos, (809) 796-5603 or (809) 796-1734

Hacienda MuÒoz R/C Track, Carr. #14, Juana Diaz, Puerto Rico 00795, (809) 837-7083

Hi-Speed C Raceways, 422 San Caludio Ave., San Juan, Puerto Rico 00926; Carlos Ortiz, (787) 283-0198

Isabela R/C Track, 390 Sur, Guaynabo, Puerto Rico 00969; Fernando Salcedo or Albaro Obregon, (787) 720-1176

RHODE ISLAND

Tri-State R/C Raceway, 205 Hallene Rd., Warwick, Rhode Island 02886; Raymond Dean, (401) 738-4908

SOUTH CAROLINA

Carolina R/C Speedway, 1555 Turkey Highway, Easley, South Carolina 29640; Craig Prahl, 864-295-1209; email: cprahlrc@mindspring.com; web: www.carolinarc.com

Extreme R/C Raceway, 5976 Grace Lane, Myrtle Beach, South Carolina 29577; Kevin Bullock, (803) 236-2083

Atlantic World of Hobbies, 2458 Remount Rd., North Charleston, South Carolina 29406; Jimmy Closson, (843) 554-3546

The Grove Racing Center, 939 S. Anderson Rd., Rockhill, South Carolina 29730; Mike Durham or Don Faris, (803) 327-4121

Hobbies and More, 1570 S. Main St., Darlington, South Carolina 29532; Jerry Pollard, (803) 393-0355

J&M R/C Hobbies, 5341 Dorchester Rd., Evanston, South Carolina 29418; Mike Smith, (803) 552-9449

ORA Atomic Racing Facility, 373 Boyd Pond Rd., Aiken, South Carolina 29803; Bill Jackson, (706) 855-0846 or (803) 642-0314

Bethany Motor Speedway, 959 Wilmohr Rd., Clover, South Carolina 29710; Eddie Spearman, (803) 222-4758

Darlington R/C Raceway Hobbies & More, 1570 S. Main St., Darlington, South Carolina 29532, (843) 393-0355

The Racing Connection, 4375 Juniper Bay Rd., Conway, South Carolina 29527-4129; Dave Hamilton, (843) 397-0124

Skateland USA, 202 Hwy. 29, Anderson, South Carolina 29621; Jon Fulmer, (864) 225-1840

SOUTH DAKOTA

Action R/C Raceway, 107 N. Main, Mitchell, South Dakota 57301; Royal(daytime) or Roger(evenings), (605) 996-6895; email: rtj2@home.com

Boomerans Raceway, 105 N. Main, Hartford, South Dakota 57033; Ed Smithback, (605) 528-7345

Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, South Dakota 57401, (605) 226-0604

Goldtrax Raceway, 409 E. High, Lead, South Dakota 57754; Steve Brown, (605) 584-2355

R/C Action Raceway, SE Corner at 484th & Hwy. 38, Sioux Falls, South Dakota 57105; Brian Cox, (605) 373-0511

Tri-State R/C Club, Sioux Empire Fair Grounds, Sioux Falls, South Dakota 57105; Chad Walth, (605) 357-9654; email: man@email.msn.com

TENNESEE

Interstate Raceway, 5237 Highway 126, Blountville, Tennesee 37617; Dale or Mark, (423) 323-1513; email: mkstarnz@intermediatn.net

D&M's Downtown Raceway, 2703 U.S. Hwy. 411S, Maryville, Tennessee 37303, (423) 681-8919

Futrell's R/C Hobby Shop, 1715 Jackson Ave., Seymour, Tennessee 37865; Dan Futrell, (423) 908-9526

Hobby Town USA, 2000 Mallory Lane, Franklin, Tennessee 37067; Bobby Mills, (615) 771-7441

MSA R/C Racing, Rt. 12 Box 489 B, Crossville, Tennessee 38555; D.R. Findley, (931) 456-0027

TnT Raceway, 643 Loop Hollow Rd., New Tazewell, Tennessee 37825; Cliff Swett, (423) 626-9065 or (423) 869-8942

W.O.W. Raceway, 59 Luray Rd., Beech Bluff, Tennessee 38313; Brad Jones, (901) 427-1625; email: wowmngr1@abac.com; web: go.to/wowracing

MID-South Racing Association, 9155 Hwy. 72 (Poplar Ave.), Germantown, Tennessee 38138-7903, (901) 757-8774

R&R Racing Portable Track, RR3 Box 34, Linden, Tennessee 37096; Ross or Ron, (931) 589-5433

TEXAS

The Rollcage, 3819 Hwy 34 South, Greenville, Texas 75402; Guy Allen, (903) 883-0332; email: rollcage2000@earthlink.net; web: www.therollcage.com

Mammoth R/C Racing, 4221 Spencer, Pasadene, Texas 77504; John, (713) 946-2522

Star/Car Raceway, 5802 Patton St., Corpus Christi, Texas 78415; Glen Stead, (512) 949-8525; Race Hotline, (512) 881-6105

Texas Speedway, 6707 Chimney Rock, Bellaire, Texas 77401; web: TexasSpeedwayRC.com

Warehouse Radio Controlled Raceway, 5119 Plains Blvd., Amarillo, Texas 79101; Craig or Darren Waddell, (806) 374-6485

W.E.S. Hobby Race, 980 S. Fourth St., Beaumont, Texas 77701; Edmond Richards, (409) 839-4929

215 Speedway, 1814 County Road 215, Abilene, Texas 79602; Clyde Gardner, (915) 673-2351

B&B R/C Hobbies, 700 East 4th, Big Spring, Texas 79720; Walter Bumbulis, (915) 263-1790

Big Mike's R/C Raceway, 1405 W. Cotton St. (behind the Locker Room), Longview, Texas 75604; Mike Sumrow, (903) 297-7814

Discount Hobbies, 1722A West Anderson Loop, Austin, Texas 78757; Tony Bermudez, (512) 458-2324

Drycreek Raceway, 2518 I-30W, Greenville, Texas 75402; Micky Alphin, (903) 527-5381

K&M Racing, 45000 Hwy. 59 N., New Caney, Texas 77357; Brent Mahaffy, (281) 399-9777

Hal's Hobby Raceway, 1440 Bessember, El Paso, Texas 79936, (915) 591-2213

Hobbytown USA, 999 E. Basse Rd., Suite 177, San Antonio, Texas 78209; Joe Sena or Clark Baisdon, (210) 829-8697; fax (210) 829-8707

Indy R/C World, 220 Saturn Rd., Garland, Texas 75041; Steve Webster, (972) 271-4844; fax (972) 271-4502; web: www.indyrcworld.com/indy_track.htm

Issac's Race Track, 18177 Gulf Frwy., Houston, Texas 77598; Issac Ben-Ezra, (281) 488-8697

MBRC Off-Road Raceway, 204 D&E Valley Lane, Kennedale, Texas 76133, (817) 292-5055

Mike's Hobby Shop Superstore and Raceway, 1605 Crescent Circle, Carrollton, Texas 75006, (972) 242-4930; web: www.mikeshobbyshop.com

Performance Raceway, 1106C Witte Rd., Houston, Texas 77055; Jorge Tabush or Terry Schmid, (713) 464-4458

Rev It Up Raceway Practice Track, 3076 Kellar Rd., Smithville, Texas 78957; Rev, Alton T. Edwards, (512) 237-5903

T&M Raceway, 4150 Beltline Rd., Addison, Texas 75244, (972) 478-2399

T&T R/C Cars, 3420 Avenue K, Ste. 154, Plano, Texas 75023; Joe Sullivan, (972) 633-2470

Comanche Trail RC Park, City Park, Big Springs, Texas 79720; Allen Nichols, (915) 263-4241

Hot Rod's Raceway, 4218 Boston Ave., Lubbock, Texas 79413; Rodney, (806) 797-9964

T.Q.Offroad Raceway, 6236 Quail, El Paso, Texas 79924; Efren Saenz, (915) 821-7522

UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, Utah 84044; David Mott, (801) 250-8303

Vision Hobby, 352 N. State St., Orem, Utah 84057; Ken Rice, (801) 226-6226

Payson R/C Raceway, 955 S. Main, Payson, Utah 84651; Gus Wood, (801) 222-8677; email: www.b757brad@aol.com; web: None

Hobby Haven Raceway, 4135 West 575 North, Cedar City, Utah 84720, (435) 865-1274

WOR R/C Raceway, 3170 Brinker Ave., Ogden, Utah 84401; Brian Worton, (801) 393-2530

VERMONT

Bradford R/C Racing, Main St., Bradford, Vermont 05033; Seth Bean, (802) 222-9674

Stoughton Pond Raceway, Stoughton Pond Rd., Perkinsville, Vermont 05151; Rick Adams, (802) 263-9321

Barre Town R/C Club, South Main Rte 14 Wall St. Complex, Barre, Vermont 05641; Peter Perreault, 802-476-9458; email: barrerc@AOL.COM; web: hometown.aol.com/barrerc/home.html

Empire Hobbies Off-Road Raceway, 272 North Main St., Saint Albans, Vermont 05478; Scott or Jen, (877) 4-HOBBIE; email: mpirhobe@Togethr.ne

VIRGINIA

Brad's Hobbies, 1105 Greenville Ave., Staunton, Virginia 24401; Brad, (540) 885-3642

Brown Brothers Hobbies, 17297 Jeff Davis Hwy., Dumfries, Virginia 22026; Joe or Bob Brown, (703) 221-5746; email: joeonenut@erols.com; web: www.bb.hobbies.com

Cooper's R/C Race Center, 4000 Sago Rd., Chatham, Virginia 24531; Norris Cooper, (804) 724-7342 or(804) 724-4182

DRCW Raceway, 2200 Commerce Parkway, Virginia Beach, Virginia 23454; Les Modlin, (757) 340-6681

Gloucester Scale Hobbies, 2352 George Washington Memorial Highway, Hayes, Virginia 23072; Rob Thein, (804) 642-3484

Hampton RC Speedway, 1920 E. Pembroke Ave., Hampton, Virginia 23663; Steve Long or Mickey Kern, (757) 723-1884

K & W Hobby and Sports, 5186 Nine Mile Road, Richmond, Virginia 23223; Ross Martin, (804) 737-3904

KC's Radio Control & Repair, Rt. 4, Box 312, Lynchburg, Virginia 24503; Curtis or Kim Wright, (804) 384-8596

Olde Towne Hobby Shoppe, 9105 Center St., Manassas, Virginia 22110; Arnie Levine, (703) 369-1197

Roadmasters/ Rick's Hobbies, 12201 Balls Ford Ave., Manassas, Virginia 22110; Rick, (703) 330-6833

Shamroc Raceway, 106 Cheviot Place, Stephens City, Virginia 22655; Scott Janow, (540) 869-3551

Thunder Road RC Racing, P.O. Box 1022, Troy, Virginia 22974-1022; James Palmer, (804) 589-8174

The Tiltyard, 6994 Tiltyard Drive, Dayton, Virginia 22821, (540) 828-3476; email: tiltyard@rica.net; web: www.tiltyard.com

Trainland R/C Racing, 5661 Shoulders Hill Rd., Suffolk, Virginia 23435; Frank Stevens, (757) 488-5454

Thunder Road RC Speedway, 18079 James Madison Hwy, Gordonsville, Virginia 22947; Robert Bingler, (804) 296-6549; email: rwb3y@virginia.edu; web: www.come.to/thunderroad

The Racer's Edge, 1230 West Main St., Danville, Virginia 24541; Al Harville, (804) 792-6011; email: webmaster@theracersedge.virtualave.net; web: http://theracersedege.virtualave.net

WASHINGTON

Race City, 125 E. Main St., Auburn, Washington 98002; Craig Haslebacher, (253) 939-2515

A-Main Raceway, 14011 NE 3rd Ct., Vancouver, Washington 98685; Monty Coleman, (360) 571-8404

Burien Toyota R/C, 15025 1st Ave., Seattle, Washington 98148; Ray Meek, (800) 654-6456

Cedardale Raceway, 1673 Cedardale Road, Mount Vernon, Washington 98273; Joe Madonia, (360) 659-0072; email: getchell@halcyon.com

Four Season R/C Racing, 2941 Sleater Kinney Rd. NE, Olympia, Washington 98506; Gary and Sharon Brown, (360) 491-2430

Spokane Indoor Raceway, 6422 E. 2nd Ave., Spokane, Washington 99212; Dave Mapston, (509) 534-RACE

Tacoma R/C Raceway, 6305 6th Ave., Tacoma, Washington 98406; Scott Brown, (253) 565-1935

Ultimate R/C Raceway, 907 Cole St. #3, Enumclaw, Washington 98022; Dan Daugherty, (360) 802-2388

West Coast Hobby & Raceway, 2239 Stevens Drive, Richland, Washington 99352; Darren Shank, (509) 375-4995

Zep's Hobbies & Raceway, 530 Interlake, Moses Lake, Washington 98837; Steve Ralph, (509) 765-8191

Redmond Hobbies Raceway, 16290 Redmond Way, Redmond, Washington 98052; Stan Ng, (425) 885-3639; email: info@redmondhobbies.com; web: redmondhobbies.com

Rain City RC Raceway, 3616 South Road, Suite A-3 (V-5 Industrial Park), Mukilteo, Washington 98021; Pete or Debbie Cartwright, 425 438-2454; email: info@raincityraceway.com; web: www.raincityraceway.com

Schmidt's Auto Parts, 10305 Smoke Point Blvd., Marysville, Washington 98271; Jon Failla, (360) 653-8838

Hank Perry Raceway, 1901 Sullivan Rd., Spokane, Washington 99023; Hal Hudson, 509-879-3503; email: halshudson@msn.com

Bear Creek Raceway, 6319 Maltby Rd., Woodinville, Washington 98072; Nathan Brockway, (425) 398-0140

Fantasy World Raceway, 7901 S. Hosmer, Tacoma, Washington 98408; Dave Kleinman, (253) 473-6223; web: www.fantasyworldhobbies.com

WEST VIRGINIA

Burr-Fab Raceway, 90 Davis St., West Union, West Virginia 26456; Mark Travis, (304) 873-2487

Fulton's R/C Raceway, 2646 Chapline St., Wheeling, West Virginia 26003; James Fulton, (304) 233-5355

Left Turn Hobbies, 100 Saco Ln. (by Post Office), Glen White, West Virginia 25849; Glen White, (304) 255-3930

Race Zone, Hopewell Rd., Rt. 8, Box 343A, Fairmont, West Virginia 26554; Joe Clutter, (304) 368-1000

Philippi Superspeedway, Rt. 1, Box 69A, Philippi, West Virginia 26416; Eric, (304) 457-1438; email: Firehawk119@cs.com

Quiet Dell Raceway, Rt. 6, Box 1616, Fairmont, West Virginia 26554; Darris, (304) 366-1441; email: Tateracing@aol.com

WISCONSIN

MARCCA Raceways, 526 S. Monroe St., Monticello, Wisconsin 53570, (608) 243-1778

ABC R/C Inc & Raceway, 244 W. Main St., Waukesha, Wisconsin 53186; Dick Mathiesen, (414) 542-1245

Gary's Hobby Center, 3701 Durand Ave., Racine, Wisconsin 53403; Bill Phalen, (414) 554-8884

Hobbytown USA - Revolution, Memorial Mall, 3347 Kohler Memorial Drive, #D2, Sheboygan, Wisconsin 53081; Kenny, (920) 452-0801

Mid-West Tri-Clone, 3745 Shuster, West Bend, Wisconsin 53095; Tom Holz, (262) 334-0487, 334-0429; email: mwtc@hnet.com; web: www.triclone.com

Pro-Star Racing, 726 Pine St., Green Bay, Wisconsin 54301; Chuck or Terry, (920) 494-1233 or (920) 469-5566

Revolution Raceway, Memorial Mall, 3347 Kohler Memorial Dr., #D2, Sheboygan, Wisconsin 53081, (920) 452-0801 or (800) 594-9420

S&N's Trackside Hobbies and Raceway, 6045 N. Green Bay Ave., Milwaukee, Wisconsin 53209; Scott Ernst, (414) 351-1910

Best's Hobbies, 2700 West College Ave., Appleton, Wisconsin 54914; Peggy, (920) 734-5244

Dirt Heaven Hobby & Raceway, 6028A County Rd. K, New Franken, Wisconsin 54229; Aaron, (920) 866-9096; email: sales@dirtheaven.com; web: www.dirtheaven.com

R.J.S./R.C., 4920 Hwy 70W, Eagle River, Wisconsin 54521; Randy Stys, (715) 479-2541

WYOMING

Collectable CreationsOff-Road Oval Track, 1790 Dell Range Blvd., Cheyenne, Wyoming 82009; Phil Severson, (307) 632-2156

ARGENTINA

Club A. Velez Sarsfield, Av. J.B. Justo 9000, C.P. 1408, Buenos Aires; Jorge Herrero, 54-01-658-5851

Circuit M.R. Models, Av. Monroe 1402, Capital Federal, Pque. San Martin - Cmno. del Buen Ayre y Pte. Debenedetti., Buenos Aires 1428; Maximiliano Roballos, 54 11 4557 1000, fax 4780 1677; email: info@kyosho-argentina.com.ar; web: www.kyosho-argentina.com.ar

AUSTRALIA

R.C. Speedway, 259 King Street, Newcastle, New South Wales 2300; Andrew Dillon-Smith, 02-49265966

Carine R/C Model Car Club, Inc., Penistone Reserve, Greenwood, Western Australia; David Werner, 61-418922966

TFTR - Templestowe Flat Track Racers, Corner of Porter St. and Williamsons Rd., Templestowe, Victoria 3106; Nigel George, see website; email: tftr@image-file.net; web: drive.to/tftr

A.C.T. Remote Control Car Club, Jenke Circuit, Kambah, ACT; Rob Jorgensen, 61-2-6231-9925; email: bjorgo@isr.gov.au; web: users.bigpond.net.au/grj/actrccc.html

A.C.T. Model Car Racing Club, Wanniassa Raceway, Hyland Place, Wanniassa, ACT; Gary Davey, 61-6-2871411

Aubry R/C Car Club, Aubry Showgrounds, Aubry, New South Wales 2640; Ron Langman, 060-247-128

Canberra Off-Road Model Car Club, Goyder St., Narrabundah, ACT 2604; Graham Brown, 61-6-241-3070

Central Coast ORRCC, EDSACC Sports Complex, Bateau Bay, New South Wales 2261; Peter J. Knight, 61-43-693-698

Fast n' Fun, 250 Potreath Rd. Bellbrae West, Torquay, VIC 3228; Stephen Chara, (613) 5266 1550 or (613) 5266 1556

Illawarra RCECC, Croome Sporting Complex, Albion Park Rail, New South Wales 2527; Mel or Andrew, 042-714-683

Lakeside R/C Racing Car Club, Hollywood Dr., Lansvale, New South Wales 2166; R. Bartolozzi, 62-2-907-9800

Melton Electric Circuit Car Association, Safeway Car Parkm Corner High St. and Coburns Rd., Melton, VIC 3337; Arthur Joslin, 61-3-9747-8805

Northern Districts Model Rally Club, Rear Stanford Centre, 16 Stanford Way, Malaga, Western Australia 6066; G. Thirlwell, 61 (9) 249 3855; fax 61 (9) 249 4778; email: tony@ois.com.au

Penfield Park, DSTO Complex Salibury, Adelaide, South Australia 5108; Trevor UNew South Walesorth, (618) 8289-5010

Wodonga R/C Car Club, 11 Murphy St., Wodonga, VIC 3690; Ron Langman, 61-60-247-128

The Bayside Raceway, Wynnum Manly Workers Club, Bognor St., Wynnum, Brisbane, Queensland 4178; Nigel Bell, 07 3893 1864; email: mwr1@one.net.au

Wee Waa's Offroad RC, KYEEMA, Burren Junction, N.S.W. 2386; Shane, 61-02-6796-1339

AUSTRIA

RMC-Wien, Aspernstrasse 5, Vienna A-1220; Herbert Holze/Martin Hrzak, +43-664-4730376

BELGIUM

ATR-Alka-Tele-Racing, 3570 Stationstraat 21, Limburg; Alken, 0032-11-25-49-03

Cartroubles Indoor Buggy Track, Jan Moonsstraat 52-56, Womme-lgem 2160; Guy Ermes, 32-3-326-51-15; fax 32-3-326-51-01

MBV-Kampenhout, TeniersIn 28, Kampenhout B1910; Frank Mostrey, 0-16-65-75-18

MRCZ, Centrum, De Burg; Montie, 75-71-63

Model Racing Club Oudenaarde (MRCO), Eindrieskaai-Scheldekant, 9700 Oudenaarde; Nicky Delmote, and fax: 32 55 30 36 25; email: mrco_racing@hotmail.com; web: mrcoracing.tripod.com

R.C.R., Peilstraat 43, Retie 2470; A. Eelen, 32-14-379685

KEY TO SYMBOLS

Indoor	Concrete
Outdoor	Asphalt
Off-road	On-site hobby shop
Oval	AC power
Dirt oval	Auto lap counting
Carpet	Food available

BRAZIL

Amoc CassociaÁao de Modelismo B. Camboriu, Junto ao Par Que Ecologico de Bal Camboriu, Bal. Camboriu, South Carolina 88.330-000; Leo Cesar, (047) 366-0001

Brasilia R/C Motor Circuit, Estacionamento do Estadio Mane Guarrincha, Brasilia, DF 70000; Alexandre (Alex), 55-061-273-7205

C.A.A.R. Curitiba Associacao de Automodelismo Radiocontrolado, Rua Theodoro Makioka, n 2300 Santa Candida, Curitiba, Puerto Rico 82650-530; Ronaldo Assumpcao, 55-41-354-2804

Electric Car Club R/C Santos, Av. Bernardino de Campos, 227, Santos, SP 11065-001; Estevam or Arnaldo, 55-013-232-2536

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Jungle Drive, Rua Alberto Maranhao, No. 219 Icha do Gov, Rio de Janeiro, PB 21940-490; Paulo Brito, (021) 396-0851 or (021) 393-7449

MP Raceway, AV. Nacoes Unidas, 6815 Lapa, Sao Paulo; Gerd Heitrotter, 55-11-9819039; web: www.hpraceway.com.br

Off Roaders, Av. Guillerme Dummont Villargs, 317, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931

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Club RCSI, 44 Rue Holliday, Sept-Iles, Quebec G4R; Sylvio Gerard, (418) 968-6575

CRCCC, Box 309, Clinton, Ontario NOM 1LO; Eric Russell, (519) 482-9429

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CTL, 495 Industriel, Longeuil, Quebec, (514) 358-4419

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Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530

J-T International Raceway, 127 Milligan Lane, Napanee, Ontario K7R 8A1; N. O'Neill, (613) 354-0099

Leading Edge R/C Speedway, 731 Gardiners Rd., Kingston, Ontario K7M 3Y5; Mike and Tony Daicar, (613) 389-4878

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Miniatures & Passions, 204 St. Charles, #103, Ste., Therese, Quebec J7E 2 B4; Gilles Lachance, (514) 979-7989

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Vancouver R/C Road Racers, #100-2733 Barney Hwy., Coquitlam, British Columbia V3E 1K9; Roger Brown, (604) 945-3888

Action Weelz, 462 Turcotte, Vanier, Quebec G1M 1R6; Regent Tardif, (418) 527-5756

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MC Koln, Bottgerstr, Worringen 50769; Ralf Habel, 02733-477493

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Dreykorn Raceway, Heuchlinger-Hauptstr. 43, Lauf 91207; Hermann Hensel, 09123-81457

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1st Circuit, Kompleks Villa, Kalijudah Indah, Surabaya, 62-31-5681965

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Yokota R/C Racers, PSC #78, Box 3889, Tokyo APO AP 96326; Donnie Leornas, 81-3-11-757-2012 or 755-2272

KEY TO SYMBOLS

Indoor	Concrete
Outdoor	Asphalt
Off-road	On-site hobby shop
Oval	AC power
Dirt oval	Auto lap counting
Carpet	Food available

Zama Off-Road Raceway, 17th ASGCM Unit 45013, Box 3232 APO AP 96338; Ken Campbell, 81-3117-63-8478

KUWAIT

Inferno DX 4WD Track, P.O. Box 9167, Ahadi 61002; Yousuf Acqatari

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Jump Square Arena, Al21,SG, Buloh N/V, 47000 , SG, Buloh, Selanhor; Thomson Chong, (603) 656-2513

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Tony's Track, Obregon 364 Sur, Culic-n, Sinaloa; Guillermo Prieto, 67-165708-168141

R/C Racing Club, Obsidiana #2900, Zapopan, Jalisco 44560; Fernando Hernandez, 3-616-73-47

Pista Casino, Hotel Casino de la Selva, Cuernavaca, Morelos 16507; Luis Duhart, 73-19-12-38

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Hobby Model's Raceway, Blvd. Garcia de leon, 1555, Morelid, Michoacan 58260, 431-5-01-22

Hobby's Formula, Au observatorio 457, DF 01120, 905-502-3620

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M.A.C. Vlymen, Nieuwkuijkseweg, Nieuwkuijk; Arjan van de Graaf, 31-416-376298

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Papakura Indoor R/C Car Club, 25 Tainere Cres., Papakura, Auckland; Colin Perry, 09-298-4711

Harewood Radio Control Car Club, 550 Sawyers Arms Rd., Christ Church; Dean Johnson, 09-0- 3880 344

Counties R/C Raceway, Pukekohe Showgrounds, Station Rd., Pukekohe; R. Northcott, 09-23-86904

Capital Model Racers, Avalon, Lower Hutt; Roger Whitmarsh, 04-566-5714

NORWAY

Aurskog R/C Club, Aursmoen, 1930, Aurskog; Tommy Gjeleseth, 47-63-86-21-61

Dalen Raceway, P.B. 728, 6401, Molde; Johnny Reitan, 94 64 52 95

Store-Baller Raceway, 2750 Gran, 3/17/99 61330225; Ola Raastad

Hadeland Raceway, 2750 Gran, Gran; Dag Bakke-Nilssen, 61330405

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Quezon City Radio Control Club, Quezon City Memorial Cir., Quezon City; Benjie Lumanlan, 731-94-53

Philippine R/C Association, B.F. Homes Paranaque, Manila; Ronald/Manny Villaflor, 23-30-08

Phillipine F1/Touring Club, Super Mall I, EDSA, Quezon City 1156; Raymond Aguilar/Ron Villaflor, 896-64-15/23-30-08

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Gordons Bay R/C Club (GBRC), Andrew Norman Sports Centre, Gordons Bay, Cape Province; Andre Hollander, 024-512865

Lowveld Radio Control Thunderdrome, Lion's Club Kanyamazne Rd., Nelspruit, Eastern Transvaal; Martin Van Der Merwe, 01311-534-6415

Phoenix Raceway, 1 Tugela St., Stilfontein, Transvaal; Lionel Edwards, 018-4842863

Pick 'n' Pay Model Car Club, P.O. Box 11654, Klerksdrop 2570; H. Grobks, (27) 18 46245421

Pietersburg Model Racing, Landros Marais St., Pietersburg, Northern Transvaal; Peter Van Vuuren, 0152- 293-0700

R.C. Superbowl, Elsburg Sports Grounds, Elsburg, Johannesburg; Karl Fawcett, 27119076145

R.A.C.E. Off Road, Cecil Payne Stadium, Maraisburg, Gauteng; Derrick Plank, 682-2173

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Sollenbrunn Miniracing Club, Enehagsgatan 63 SE-441 57, Alingsaas; Tage Johansson, 46-322-40944; email: tage.j@swipnet.se

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Hobbica Circuit, 83 Moo 13, Petchakasem Rd., Plong Maduea, Maung, Thailand 73000; Mr. Supakiet Thuwachardenpanich, 66-34-258808; email: hobbica@yahoo.com

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Chris's BACK LOT

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. My email address is: chrisc@airage.com.

BY CHRIS CHIANELLI

New York—New York

Walking the show, I came across something that, I thought, was right up Steve Pond's alley. I call it "the FI-FI Racer." Thinking about how I'm going to slaughter Steve this summer in the nitro truck class and how, since both "pink" and "Pond" start with the same letter, this car would suit him just fine after I finish with him this race season. So I kicked the tires and checked out Steve's summer of 2001 ride—the FI-FI Racer! Actually, this thing is from a company called Gear Box, and it features thicker sheet-metal work than is found on most of today's cars. Retro high-quality toys are back in force.

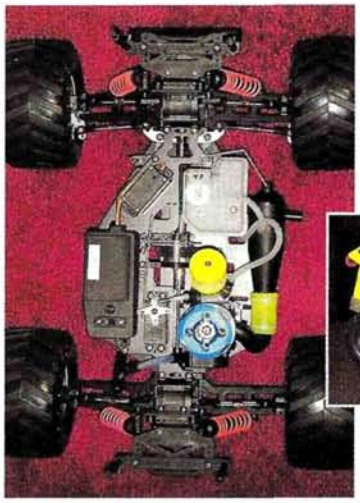
Living only an hour away from the "Big Apple," I decided to take a cruise to the city and to check out this year's New York Toy Fair at the Javits Center. Why? Because I love RC stuff—and I mean anything RC. Sure, during the summer, I love meeting the other *Car Action* guys at a local track on Sunday for some "serious fun" truck racing, but I also love the "pure fun" RC stuff, too. Life is too short to be "Mr. Serious." If ever the hobby stops bringing a smile to my face, that's the day I quit! And there was plenty of fun RC stuff to smile about at the New York Toy Fair—some serious stuff, too.

There were a few familiar names: Kyosho; Great Planes; Megatech—just to name a few. Megatech is only 20 minutes from the big city, so its folks were there in force both with fun and serious new stuff.

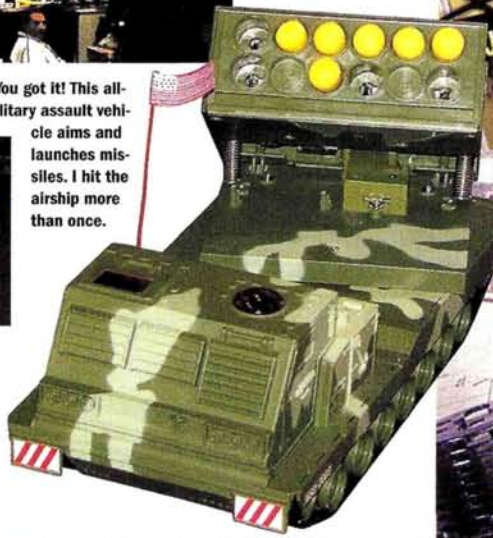
New York City is a wild and exciting place. The 90mph taxi ride down Broadway was one of the wildest parts; the driver looked exactly like Saddam Hussein—very scary.

Here I am; I made it in one piece! Saddam's suicide ride couldn't take me out. Look at those taxis (the yellow scourge). Are we in Manhattan or what?

Left: The Megatech Airship/Area 51 is a U.S. Navy blimp and UFO (background) combo package. These 3-channel, helium-filled air vehicles will be great flying around my house. I have cathedral ceilings—perfect for indoor aerial patrol.



Megatech's all-new 4WD Nitro Razor MT is loaded with serious performance options. Features include: aluminum oil-filled coil-over shocks, swaybars, 2-speed tranny and painted body—just to name a few. Personally, I've always liked shaft drive, and the Razor has it. Watch for it in the near future.



Right: Mega Missile Launcher. You got it! This all-terrain dreaded and treaded military assault vehicle aims and launches missiles. I hit the airship more than once.

This is a "top-secret" Dolphin—code-named Leapin' Lena. I witnessed this do a high-speed jump though a Hula Hoop. If I tell you any more about its capabilities, I'll be targeted for extermination.

Mega Sidewinder. Note the little rocker-panel-mounted wheels. That's right! For quick lateral evasive maneuvers!—also very useful when parallel parking in the Big Apple.